UC-NRLF
$B 751 772

D GEOGRAPHIES
J. HERBERTSON

THE UPPER THAMES COUNTRY AND THE SEVERN-AVON PLAIN

N. E. MACMUNN

OXFORD: AT THE CLARENDON PRESS

LIBRARY
OF THE
UNIVERSITY
OF
CALIFORNIA

1/8

THE OXFORD GEOGRAPHIES

Edited by A. J. HERBERTSON.

PRELIMINARY GEOGRAPHY. By A. J. HERBERTSON. Second Edition. 1s. 6d.

JUNIOR GEOGRAPHY. By A. J. HERBERTSON and R. L. THOMPSON. Fourth Edition revised, with many new and improved diagrams. 2s. With *Principles of Geography*, 3s. With *Questions and Statistical Appendix*, 2s. 6d. With both, 3s. 6d.

SENIOR GEOGRAPHY. By A. J. HERBERTSON and F. D. HERBERTSON. Ed. 3, 2s. 6d. With *Physiographical Introduction*, 3s. 6d. With *Questions and Statistical Appendix*, 3s. With both, 4s.

PHYSIOGRAPHICAL INTRODUCTION TO GEOGRAPHY. Ed. 2 revised, with new diagrams. 1s. 6d.

QUESTIONS ON THE JUNIOR GEOGRAPHY. By F. M. KIRK. With *Statistical Appendix* by E. G. R. TAYLOR. 1s.

QUESTIONS ON THE SENIOR GEOGRAPHY. By F. M. KIRK. With *Statistical Appendix* by E. G. R. TAYLOR. 1s.

THE CLARENDON GEOGRAPHY. By F. D. HERBERTSON. Vol. I, 3s. Separately: Part I, Principles of Geography; Part II, British Isles; Part III, Europe; 1s. 4d. each. Vol. II, 3s. Separately: Part IV, Asia; Part V, Africa and Australia; Part VI, America; 1s. 4d. each.

PRACTICAL GEOGRAPHY. By J. F. UNSTEAD. 2s. 6d. Separately: Part I, 1s. 6d.; Part II, 1s. 6d.

GEOGRAPHY OF IRELAND. By O. J. R. HOWARTH. 2s. 6d.

AUSTRALIA. In its physiographic and economic aspects. By GRIFFITH TAYLOR. 3s. 6d.

AUSTRALIA. A School Geography. By T. G. TAYLOR.

THE BRITISH EMPIRE. By A. J. HERBERTSON and R. L. THOMPSON. 2s. 6d.

COMMERCIAL GEOGRAPHY OF THE WORLD. By O. J. R. HOWARTH. 2s. 6d.

THE UPPER THAMES COUNTRY AND THE SEVERN-AVON PLAIN. By N. E. MACMUNN.

THE ELEMENTARY GEOGRAPHIES. By F. D. HERBERTSON.

Vol. I: A First Physiography. Ed. 2. 1s. Vol. II: In and about our Islands. Ed. 2. 1s. Vol. III: Europe. 1s. Vol. IV: Asia. 1s. 6d. Vol. V: North and Central America and the West Indies. 1s. 6d. Vol. VI: The Three Southern Continents. 1s. 9d. Vol. VII: British Isles. 1s. 9d.

ELEMENTARY GEOGRAPHY OF SCOTLAND. By M. NEWBIGIN. 1s. 6d.

ANIMAL GEOGRAPHY. By M. NEWBIGIN. 4s. 6d.

INTRODUCTION TO PLANT GEOGRAPHY. By M. E. HARDY. 3s. 6d.

THE OXFORD WALL MAPS. Prospectus on application.

June, 1913.

THE OXFORD GEOGRAPHIES

EDITED BY A. J. HERBERTSON

THE UPPER THAMES COUNTRY AND THE SEVERN-AVON PLAIN

BY

N. E. MAC MUNN

OXFORD HONOURS SCHOOL OF MODERN HISTORY, AND DIPLOMA IN GEOGRAPHY, DEMONSTRATOR IN GEOGRAPHY IN THE SCHOOL OF GEOGRAPHY OF THE UNIVERSITY OF OXFORD

OXFORD

AT THE CLARENDON PRESS

1913

OXFORD UNIVERSITY PRESS
LONDON EDINBURGH GLASGOW NEW YORK
TORONTO MELBOURNE BOMBAY
HUMPHREY MILFORD M.A.
PUBLISHER TO THE UNIVERSITY

PREFACE

In spite of much that has been said of late years by leading Geographers, there is still a regrettable lack of comprehension and real appreciation of the regional conception of geography, and its great educational value does not seem to be understood. This study of the central scarpland country of England is worked out entirely on a regional basis, and it is hoped that it may give a clear idea of the method. It is also hoped very strongly that no one will try to use any one part of the book by itself. The working of cause and effect has been gradually elucidated throughout its whole course, and no one section can be properly understood without its predecessors. Neither Oxfordshire, Gloucestershire, Berkshire, nor Buckinghamshire can be studied as a separate natural unit. Each is composed of parts of various natural regions, the whole of which must be considered if any satisfactory geographical conceptions are to be obtained. The chapter on Oxfordshire, the central part of the area studied, is only added for the sake of giving a right geographical colouring to local administrative interests.

In making this study the writer has found the unpublished results of research work done by some of the students of the School of Geography very useful,

M594927

especially that of Misses Hockley and Rogers. Thanks are especially due to Mr. O. G. S. Crawford, M.A., for valuable assistance with regard to Prehistoric and Roman roads, and great use has been made of Mr. Peake's articles on the same subject. The whole has been inspired by the Editor, to whose former teaching as well as to his actual help during the writing of the book it owes all its value.

N. E. MACMUNN.

OXFORD, 1912

CONTENTS

CHAP.		PAGE
I.	Introduction	9
II.	Climate	14
III.	General View of the Cotswolds	17
IV.	Soil and Occupations of the Cotswolds	24
V.	Cotswold Towns and Villages	27
VI.	Cotswold Roads and Railroads	36
VII.	Oxford Plain; the Vales of the Upper Thames and Ray, of the Ock and Thame	41
VIII.	Occupations of the Oxford Plain	48
IX.	Towns and Villages of the Oxford Plain	51
X.	Communications in the Oxford Plain	57
XI.	The White Horse Downs	62
XII.	Towns and Villages of the Downs	68
XIII.	Roads and Railways of the Downs	73
XIV.	The Chiltern Hills	75
XV.	The Severn-Avon Valley	81
XVI.	Occupations of the Severn-Avon Valley	87
XVII.	Towns and Villages of the Severn-Avon Plain	89
XVIII.	General Map Studies and Communications	95
XIX.	Ancient Roads	102
XX.	Population and Political Divisions	107
XXI.	The Geography of Oxfordshire	113
	Index	121

Digitized by the Internet Archive
in 2008 with funding from
Microsoft Corporation

http://www.archive.org/details/upperthamescount00macmrich

LIST OF ILLUSTRATIONS

FIG.		PAGE
1.	The Thames Basin. Map	8
2.	Section across the Upper Thames Basin	10
3.	Geological Map	13
4.	Physical Map	19
5.	A Cotswold Valley	20
6.	The Stroud Gap. Map	29
7.	View of Stroud	30
8.	An Upland Town; Chipping Campden	32
9.	A Cotswold River Village: Bibury on the Coln	34
10.	Map of Highroads	37
11.	The Windrush Valley	38
12 and 13.	The Oxford Plain: Physical and Geological	40
14.	The Rivers of the Region. Map	45
15.	Sections across River Valleys	46
16.	The Thame Plain, seen from the Chiltern Escarpment	49
17.	View of Oxford	53
18.	Map of Railways	59
19.	The Thames Gap	63
20.	The Escarpment of the Downs	65
21.	The White Horse Downs	69
22.	The Chiltern Escarpment	77
23.	A Chalk Valley	80
24.	View from Cotswold Escarpment	84
25.	View of Gloucester Cathedral	92
26.	Natural Regions of England and Wales. Map	97
27.	Routes and Towns of Central England. Map	99
28.	Density of Population. Map	109
29.	County Boundaries. Map	111
30.	Towns and Villages. Map	116
31 and 32.	Parish Boundaries, Oxfordshire. Maps	118 and 119

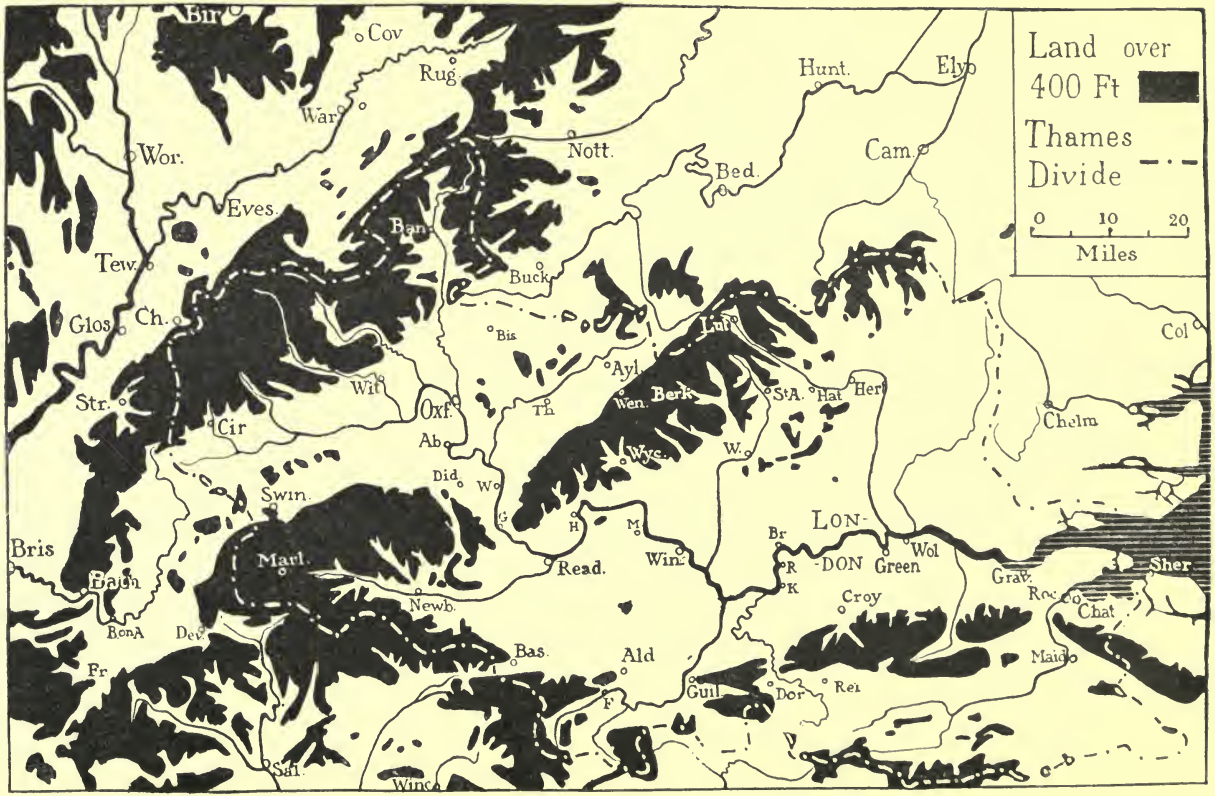


FIG. 1. THE THAMES BASIN.

CHAPTER I

INTRODUCTION

The Basin of the Upper Thames lies in the west centre of England. On one side it is bordered by the broad valley of the Lower Severn, whose wide estuary opens to the Western Sea, but in spite of this the greater part of the district is connected with the east and London rather than with Bristol and the west. The reason for this is to be found in the configuration of the land, which slopes in such a way as to make communication easier to the east than to the west (see p. 10).

To the north and north-west our region extends to the hilly districts of the Midlands, whose waters flow off in a different direction, to the north-east. In the east and south-east the Chiltern Hills and the White Horse Downs are our limits, and to the south the valley of the Bristol Avon makes an abrupt ending to the region. (See Fig. 1.)

Belts of Uplands and Lowlands. Within these limits is a country consisting of alternate belts of upland and lowland, all running roughly in the same direction, from north-east to south-west. It forms part of a larger region of the same kind, which occupies the whole central part of England from the line of the Severn and Trent on the north-west to that of the Lower Thames on the south-east.

The uplands in each case look steeply down on the plains on their north-western edges but slope gradually to the lowlands on their south-eastern sides, sending most of the water that falls on the higher slopes gently

down to the Thames on its eastward course. (See Section, Fig. 2.) A small amount only of the rainfall of the Cotswold heights runs off in streams down the steep side to the plain at its foot, to be gathered up by the river Severn and carried away to the Western Sea.

There are two of these long strips of upland country and two lowland strips which we must consider. They are: the **Cotswold Hills** towards the west; the **Severn-Avon Vale** lying beyond their north-western

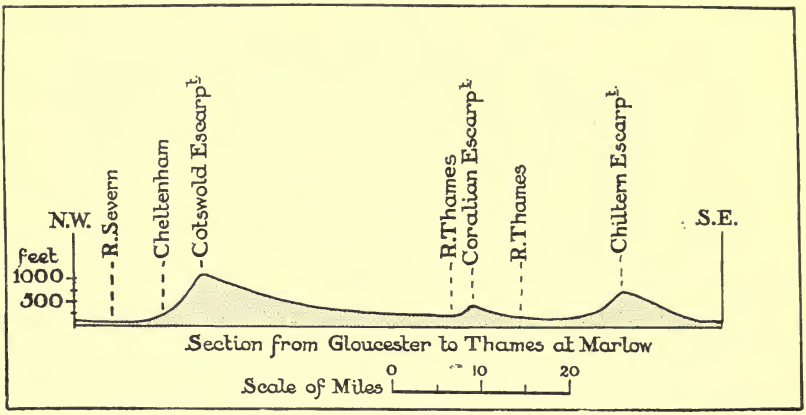


Fig. 2. Section across Upper Thames Basin.

edge; the **Chiltern Hills** with the **White Horse Downs** in the east, and the **Oxford or Upper Thames Plain** separating them from the Cotswolds. The Chilterns turn their steep faces to the Oxford plain just as the Cotswolds do to the Severn valley, and have a gentle slope down to another lowland—the London plain, which is part of the Lower Thames basin.

The basin of the Upper Thames is very definitely cut off from that of the Lower Thames by the second belt of upland mentioned above, and the two basins are only connected by the narrow passage which the river

has succeeded in cutting through the middle of it. As this deep notch made by the river divides the upland into two parts, each of which should be studied separately, there are really five distinct regions to consider. It should be noticed that the Severn-Avon plain is not part of the Thames country at all, but its relation to the Cotswold upland is so much like that of the Oxford plain to the Chiltern upland that it is natural to study it with those regions.

The Clay Plains or Vales. The differences between these five regions into which the country naturally divides are the result of the different materials of which they are made. The geological map on page 13 shows two wide strips of land made of two kinds of clay (Oxford and Lias clay), with a narrower strip formed of Kimmeridge and Gault clay. Compare this with the map showing hills and plains and you will see that the Lias clay forms the vale of the Severn, and the Oxford clay the main part of the vale of the Upper Thames. The smaller plain, cut off from this main valley by a low line of hills, corresponds with the region of Kimmeridge and Gault clay. Now clay is a rock which wears away rather quickly because it is of so fine and close a texture that no water can sink into it, and hence all the rain-water that falls runs off and carries the loose surface soil with it. The result naturally is that the land is gradually worn down to a general low level and becomes a lowland region.

The Limestone Heights. Another look at the geological map will show two other strips, separating the clay lowlands, made of two kinds of limestone (oolitic and chalk). Limestone does not wear away so quickly as clay, because it is of a porous nature. It is arranged in layers, and these are jointed. This allows some of the

rain-water to trickle down into the ground so that it does not all run off and wash away the surface. The result is that these belts of limestone country are left standing up above the clay plains on either side of them. The oolitic limestone forms the Cotswold Hills, and the chalk the Chiltern Hills and the White Horse Downs.

As there are alternate belts of more resistant and less resistant rock, so there are alternate belts of upland and lowland.

The Scarped Ridges. There is, of course, a special reason for the particular *shape* of the uplands: for the short steep slope one way and the long gradual slope the other way. This reason is the position in which the beds of rock are lying. They are not in a flat horizontal position, but are tilted towards the south-east with the highest part in the north-west, and the layers of different rock are dipping under one another. Where the hard edges of these tilted rocks stand up, a steep or 'scarp' slope, as it is called, is formed, and where the rocks dip downwards is the gentle or 'dip' slope. A belt of heights with this steep scarp slope and gentle dip slope is called a scarped ridge.

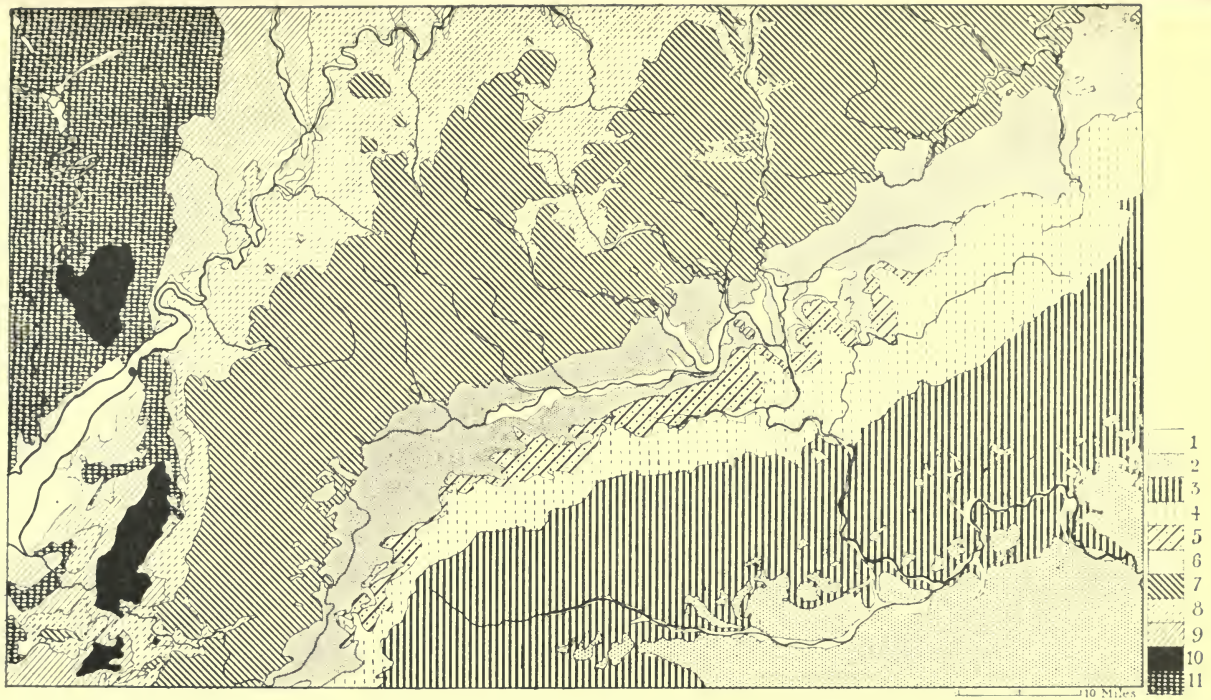


FIG. 3. GEOLOGICAL MAP.

1. Alluvium. 2. Tertiary. 3. Chalk and Upper Greensand. 4. Gault Clay, Lower Greensand, Purbeck and Portland Beds, and Kimmeridge Clay. 5. Corallian. 6. Oxford Clay. 7. Cornbrash, Oolite, and Upper and Middle Lias. 8. Lias Clay. 9. Trias and Permian. 10. Coal Measures. 11. Older Palaeozoic.

CHAPTER II

CLIMATE

Before going on to consider each of these five natural divisions by itself, it is important to know something about the climate of the whole region and to see the differences in climate between the uplands and the lowlands.

Temperature. The first thing to consider is the temperature, especially the differences between the summer heat and the winter cold. The middle part of England, to which most of our region belongs, has a rather extreme climate for the British Isles; that is to say, the difference between the summer and winter temperatures is considerable. The summers are hotter than farther south, on or near the coast, where the sea breezes cool the air; and the winters are colder than in the north-west, where the south-west winds from the Atlantic warm the air. This is to be seen in the following table of temperatures:

Place.	Latitude.	Temperature in Fahrenheit degrees.		Range.
		Coldest month.	Hottest month.	
Oxford . . .	51·5 N.	38·0	61·8	23·8
Falmouth . .	50·7 N.	43·7	60·6	16·9
Bournemouth .	50·4 N.	40·2	61·1	20·9
Ardrossan . .	55·4 N.	39·5	58·0	18·5
Oban	56·2 N.	40·8	57·0	16·2

Falmouth and Bournemouth on the south coast are cooler than Oxford in summer, and Ardrossan and Oban right up on the west coast of Scotland are warmer in winter. In other words, the farther a region is from the

sea the more extreme the climate becomes. This, of course, is because land is heated more quickly and is cooled more quickly than water. Hence, air over land is hotter in summer and colder in winter than air over sea; and lands near the coast, which get these cooling breezes from the sea in summer and warming breezes in winter, have a more equable climate than lands farther from the coast. The inland type of climate is called extreme or continental, and the coastal climate equable or oceanic. Now most of our region is away from the sea and has a sort of continental climate, though no part of the British Isles is far enough from the coast to have a very extreme climate such as you get in Central Europe or Asia.

The next thing to notice is that the climate is not the same in all parts of our area. The summers are not equally hot or the winters equally cold in the different regions. The higher the country is above sea-level the colder it is, and so in summer we go up to the Cotswold or the Chiltern uplands to get cool breezes, and in winter snow lies long on these higher lands. Look at the difference in the July and January temperatures of the following places in the lowlands and on the uplands:

Place.	Height above sea-level.	Temperature in Fahrenheit degrees.	
		Coldest month.	Hottest month.
Oxford . .	208 ft.	38·0	61·8
Gloucester .	100 ft.	39·4	62·9
Cirencester .	446 ft.	36·9	60·0
Marlborough	471 ft.	36·9	60·1

But the two lowlands even do not have quite the same climates. The western lowland is so much nearer to the sea that the vale of the Severn-Avon has a warmer and rather less extreme climate than the vale of the Thames.

Compare the temperatures of Cheltenham and Oxford:

Place.	Coldest month.	Hottest month.
Cheltenham .	39·6° F.	63·0° F.
Oxford . . .	38·0° F.	61·8° F.

How much colder Oxford is! and for this reason people who don't like cold winters go and live at Cheltenham: people, for instance, who have been accustomed to the hot climate of India.

Rainfall. The same factors influence the rainfall of the region. The hotter the air is the more it expands, and therefore the less it presses down on to the surface of the land. It has what is called a low atmospheric pressure, and cold air, which is denser, has a high atmospheric pressure. Now air coming in to a region from the outside can move more easily in an area of low pressure than in one of high pressure. The winds that come most frequently to Britain are south-west winds from the Atlantic, and these naturally bring moisture. They come generally in the form of regular circular low-pressure systems known as cyclones, and these find it difficult to penetrate the denser air over the Cotswold uplands and so pass away along the valley to the north and south. For this reason the western area gets much more rain than the rest of the region, and especially it gets more than the central Oxford lowland, because the greater coolness of air over higher lands will frequently cause rain to fall there when it is dry in the warmer lowlands. Thus it happens that the high part of the Chilterns gets a good deal more rain than the Oxford plain but not so much as the high Cotswolds edge in the west. The western plain gets about 30 inches of rain in a year (Berkeley 30·9 inches) and the higher

slopes of the Cotswolds as much as 35, while the Oxford lowland has only about 25 (Oxford 24·8 and Abingdon 25·8), and the high Chilterns something over 30 inches.

CHAPTER III

GENERAL VIEW OF THE COTSWOLDS

The Cotswold Region is a wide stretch of breezy upland, averaging about eighteen miles in width, sloping gradually from its high north-western edge, where it reaches 1,000 feet in parts, to the plain of the Thames, where the land sinks below 300 feet above sea-level. On the other side, the Cotswolds drop suddenly to the level of the Severn valley, forming a very steep slope or scarp, which is also called an escarpment. Looked at from the foot of the escarpment it seems a high range of hills. But climb to the top, and instead of finding another slope like the steep one just ascended, leading down to a valley on the other side, you come out on to a stretch of country that seems to be all at the same level. The slope this other way is so gradual that you hardly notice it.

The southern boundary of the upland is clearly marked by the deeply cut valley of the Bristol Avon, but on the north it has no such sudden ending, and fades away gently into the Northampton heights. The valley of the Cherwell will form our limit in this book, because it is the last valley that drains to the Thames in this direction.

Ridges and Valleys. It must not be thought that the slope of the Cotswolds to the south-east is continuous all along its length. It is broken in the central and northern portions by lines of heights, separated by rather

narrow depressions running roughly in the same direction as the escarpment, north-east to south-west. The high land on which Chipping Norton is placed is one of these ridges, and the valley which separates it from the height beyond is made use of for a railway running lengthwise across the Central Cotswolds after climbing the steep edge from Cheltenham. The country is also cut up by another set of valleys at right angles to the escarpment. These valleys are of course all the work of the rivers, and river action has been considerable in the Cotswolds.

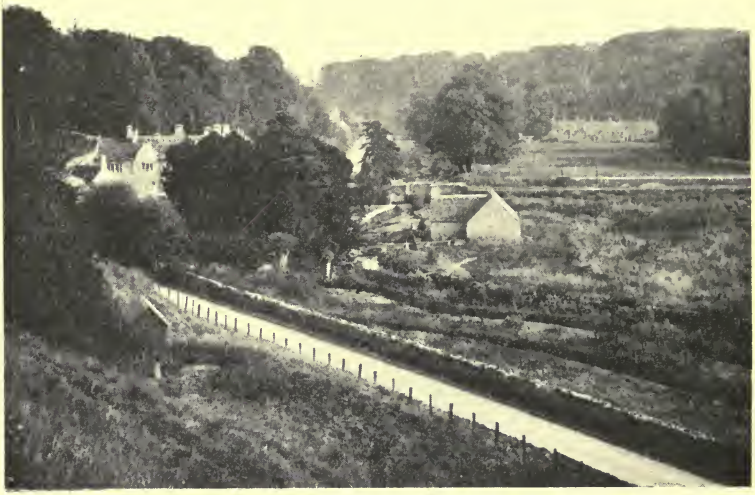
Limestone is a rock upon which rain-water has a great effect. It naturally carries away the fine particles in suspension, and besides this, it dissolves some of the limestone. The slight quantity of acid dissolved in rain-water in its turn dissolves the lime, and so the river destroys and carries away a large amount of the rock material. It is calculated that the Thames carries to the sea 291,000 tons of limestone in a year.

Dip-slope Streams. There is a series of small parallel streams flowing right across the country from the high north-western edge, following the general slope of the land. Most of these are gathered up by the main stream of the Thames, and carried away to the North Sea; but the southern part, as we shall see, is drained to the Bristol Channel.

The Wooded Valleys and Bare Plateau. The rivers have cut their way far down into the land, and formed rather deep valleys with steeply sloping sides. These sides are beautifully wooded, a great contrast in appearance to the upland itself, which is generally bare and treeless. The valleys are wooded because there is moisture there, enough for trees to grow well; but this is not the case over most of the upland. The oolitic

Fig. 4. Physical Map.

limestone which forms it is so porous (see p. 12) that the water filters away too far below the surface for the roots of trees to reach it. In some places, however, there is clay not very far below, which holds up the water near enough to be easily reached, and here woods



Photograph by H. W. Taunt & Co.

FIG. 5. A COTSWOLD VALLEY.

Notice the dense woods, chiefly beech, which cover the sides of the Coln valley. The upland on both sides is quite bare.

may be found. Beeches and firs are the trees generally seen in the Cotswolds, as they can do with less water than many other kinds. You will notice that these are not the trees to be found on the wetter clay plains. There oaks and elms flourish, and along all the rivers are willows and alders as well as other trees less often seen.

Scarp Streams. Some of the rain that falls on the

Western Cotswolds naturally finds its way down the steep slope to the Severn. Now when the slope is steeper the river is swifter, so these streams are more rapid than those of the dip slope. A stream that moves more quickly can carry more mud and sand. This you can prove for yourself any day by damming a small streamlet and then letting the water rush out. These scarp streams therefore do more work in carrying away particles of the rock than the dip streams, and their valleys are even deeper and steeper than the valleys of the south-eastern slope.

You see then that the top of the escarpment forms the dividing line between the two systems of drainage, the Thames and Severn. In only two cases do the rivers cut far into the escarpment. They are the Stroud Water and the Stour, both Severn tributaries, and more active and rapid than the dip-slope streams flowing into the Thames. These two rivers divide the Cotswolds into three parts, and their valleys provide easy routes across the uplands. The Stroud valley is much the most important in this latter respect, as we shall see later.

Each of these three parts of the uplands may now be considered shortly.

The Southern Cotswolds. In the most southerly division of the uplands, which stretches from the Avon valley to that of the Stroud Water, the escarpment runs in an almost unbroken straight line, more continuous though less high than in the section to the north of it. There are very few rivers making their way down the steep slope, and it is the rivers that do the work of destroying and cutting notches in the great wall of rock. It rises generally to something between 600 and 700 feet in height, though in the south Lansdown and Tog Hills are over 700 feet, and in the north the protruding mass

of high land that breaks the line of the escarpment near Dursley reaches 800 feet. It should be noticed that this region does not drain to the Thames. The streams of its eastern slopes when they reach the lower levels are carried, first south, then west through the deep valley of the Avon. There are not many of these eastward-flowing rivers either, far fewer than in the country to the north, and in consequence there is a less marked relief. Between the valleys there are wide stretches of undulating country diversified by many small patches of wood.

The Central Cotswolds. In the middle section of the Cotswolds, from the Stroud Water to the Stour, the escarpment is eaten into in several places, making a series of bays with cliff-like ends standing out into the plain. For instance, a look at the map will show the bay in which Cheltenham stands, with Hartley Hill shutting it in on the south and Cleeve Hill on the north, and beyond Cleeve a smaller bay with Winchcomb in the centre.

The south-eastward-flowing rivers are many, and the ridges dividing them are high and narrow, and generally bare of trees. You may compare them to the fingers of a hand held slightly open. The space between the fingers will form the valleys and the knuckles will stand for the high edge. Then if you bend the hand down from the knuckles the back of it will give you the steep slope of the escarpment. The chief valleys are those of the Churn, Colne, Windrush, and Evenlode. They are larger rivers than those of the southern and northern sections of the uplands, and have therefore cut down their valleys more deeply. In consequence, the contrast between the valleys and the upland is more marked here than in the other parts.

The Northern Cotswolds. The most northerly section, beyond the Stour and Evenlode valleys, has a rather different character. The people living in the other parts of the uplands might even tell you that it is not really the Cotswolds at all! But the same rock material is there, and geographically it is part of the same belt of upland; there is no break between it and the country to the south. One important difference there is, due to the fact that here the most resistant limestone, which forms the steep edge farther south, has been nearly all worn away and only a few remnants left standing by themselves as detached hills. Thus the escarpment stands farther back. It is formed of different and rather less resistant rock, and is not so high but just as steep, and is known in the northern part as Edge Hill. The uplands here, then, are not so wide or so high as in the central and southern sections. This division of the uplands is also distinguished by having a second water-parting or divide. The south-eastern dip-streams do not flow from the escarpment all along its length as in the other sections. In the south a valley running parallel to the escarpment and not far from it has been cut by a little river flowing into the Evenlode. The other side of this valley forms a second steep high edge to the right of the first escarpment, and from it a number of little streams flow down the gentle slope of the uplands, not to the Thames direct, but first into the Evenlode or Cherwell. The streams from the Edge Hill also flow into the Cherwell, and are carried off by this river southwards to the Thames at Oxford.

CHAPTER IV

SOIL AND OCCUPATION OF THE COTSWOLDS

The Soil. The Cotswold limestone produces a reddish loam soil, that is fairly good, though not conspicuously fertile. It is rather dry, not on account of any lack of rainfall (28–35 inches in the year), but because of the nature of the underlying rock (see p. 20). This being the case, the uplands, though they can quite well be cultivated, are more naturally suited to grass, which does not require much moisture.

Cotswold Sheep. Now this limestone grass is particularly good for sheep, and produces a breed whose wool is especially fine. In early days, when England was the chief wool-producing country and the other countries of Europe were demanding our wool, the people of the Cotswolds were naturally content to use the riches all ready to their hands in the pastures. Later, when English wool became less important, as more could be obtained from other parts of the world, and the growth of population led to a greater demand for corn, agriculture spread over a large part of the upland. At the present day, although corn-growing is less profitable than it used to be, the region is mostly cultivated and you may look a long time for the once famous Cotswold sheep.

Cotswold Wool. The demand for English wool began to be important in the eleventh century, when the art of cloth-weaving had reached to great perfection in Flanders. It is such an easy journey over there that all our wool was then sent to supply the Flemish looms, and sheep became the most profitable production of the

country. It was not very long, indeed, before we began to make cloth ourselves, to consume our own wool, and the Cotswolds were splendidly suited for this industry. There is plenty of running water to turn the mill-wheels and easy means of transport in the river Thames, navigable for barges for almost its whole length. Of course when the great change in economic conditions came, known as the Industrial Revolution, then the cloth-weaving of the district died away except in one or two specially favoured spots. It was then discovered that a force far stronger than the water power of such streams as those of the Cotswolds lay hidden in the coal of the older rocks of North-west England, for people found out how to make use of steam power.

Glove-making. Another, but much smaller industry, that has been important from very early times still survives. This is the glove-making carried on in the cottages of many Cotswold villages, while there are glove factories in the little town of Charlbury on the Evenlode and in Chipping Norton.

Agriculture. The country, however, is practically an agricultural one at the present day, and on its uplands, crossed by few railways and not easily accessible, old methods of farming are apt to linger; between Fairford and Burford, for instance, you may still see oxen drawing the plough.

The life and work of the people depend very much upon the season of the year. With the coming of each season, and the effect of the change in climate on plant growth, there comes a change in the occupation of the people. The agricultural year may be said to begin in the early autumn when, the harvest being well over, the ground has to be prepared for a new cycle of growth. The labour of the farm is now concentrated upon this

work. All over the uplands the fine farm-horses may be seen drawing the plough and the man behind guiding it, moving slowly in long lines up and down the fields, for the modern steam plough is hardly to be seen here. This work must not be lingered over, because the later harrowing and then the sowing, in the case of the wheat crop, must be done before the harder frosts come and prevent the seed getting into the ground. The country now shows a beautiful rich brown colour with all this newly turned earth.

Then comes the time of winter cold, when there is little or no work to be done except that connected with the live stock. Cattle have to be fed, and the shepherds are busy not only feeding the sheep but in the higher parts of the uplands perhaps keeping them out of snow-drifts. The country may now seem very lifeless, but with the breaking up of the frosts and the first warmth of spring there comes a change and busy work begins again.

Spring is the sowing time if the crop is barley or oats, as it usually is on the higher uplands, for the soil is thin and not heavy enough for good wheat, and the climate scarcely warm enough to ripen it well. The Cotswold barley is particularly good and much in demand by brewers, and is the most widespread corn crop in the district. Once the crops have begun to come up there is constant work to be done, such as hoeing and rolling and harrowing, till the time comes for the harvesting. Over most of the uplands this is not till late in August, and sometimes the corn is not all in till well into September. There is a proverb belonging to this district which says: "As long in coming as Cotswold berle" (barley). In the hotter plain country the harvest comes much earlier.

CHAPTER V

COTSWOLD TOWNS AND VILLAGES

Water and Villages. Although there is a good rainfall over the region, we have seen that the moisture sinks away very quickly into the ground, and that there is plenty of water, but it is down underneath and difficult to find and only deep wells can reach it. Now as people cannot live without a good supply of water, the Cotswold upland is naturally a region of few inhabitants and therefore of lonely roads along which you may go for miles without meeting a single person. The small villages and the few towns are nearly all to be found, as might be expected, in the river valleys, with only scattered farms on the uplands between. Look at the number of little villages in the Colne valley, for instance. In the seven miles above Fairford there are seven, four of them having less than 200 inhabitants. On the uplands round there is hardly a house till you reach the Churn valley on the one side and the Windrush on the other, each with its set of little villages (see Fig. 30).

Sites of Towns. It is easy to understand that the larger the valley is the larger the villages will be, and sometimes they have grown to be towns, as in the case of Banbury in the wider Cherwell valley. In the same way, at the points where the valleys open out on to the plain, small towns have usually grown up. There is Cirencester where the river Churn begins to leave the uplands, Fairford where the Colne enters the lowland, and Witney in a like position on the Windrush.

Cirencester. Of these Cirencester[1] has always been

[1] Pronounced Sisiter. The spelling has misled even local people.

the most important, for several reasons. A study of the contoured map will show that the way between London and the west, between the Thames and the Severn, is blocked first by the chalk uplands and then by those of the Cotswolds. As we saw, the Stroud valley makes the one deep cut across this last barrier, opening an easy way to the Severn lowland. This opening leads almost directly to the position of Gloucester, important as guarding the route into Wales, standing near the lowest point at which the river Severn can be easily crossed. Now Cirencester stands at the eastern end of this gap; that is to say, at a spot which must be passed by every one using the route. From here, too, various other ways across the uplands diverge, such as that up the Churn valley leading by a notch in the escarpment to the plain beyond, where Cheltenham stands. A position such as this of Cirencester must be important in any age. We can see this if we go right back to Roman days, when it was the site of an important camp and of many luxurious villas, a centre of Roman social life. Three of the great highways of the kingdom were brought through it: the Fosse Way, one of the chief cross-roads of Roman Britain, connecting the south-west with the north-east, the Exe mouth with the Humber; Ermin Street, connecting London with the Severn plain; and Akeman Street that joins Cirencester to the other main Roman road across mid-Britain from south-east to north-west, from London to Chester (i. e. Watling Street).[1] The Saxons destroyed Cirencester only to build it up again, the Normans set up a castle there, and when the woollen industry developed in the fourteenth century it became an important centre. It

[1] See also chapter on Ancient Roads.

is true it has been left behind in the race of modern days, but it is still one of the chief Cotswold towns.

Stroud and the Stroud valley. Stroud, at the western end of this same cross-Cotswold route, although much less important in early days, began to outgrow Cirencester with the later development of cloth-weaving.

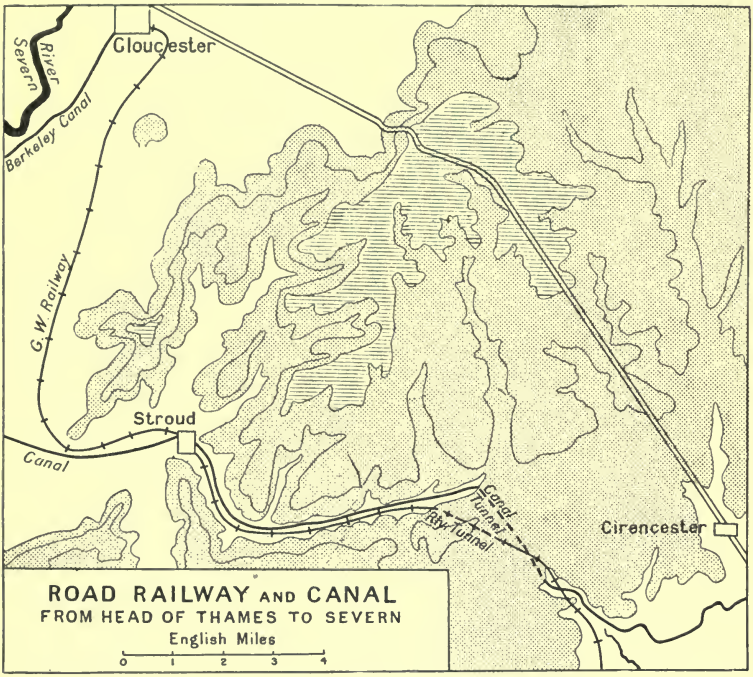


Fig. 6.

It had more water power at its command and was much nearer Bristol, the port and outlet for the cloth of this district. Further, the railway, which has taken advantage of this natural route over the uplands, passes through Stroud but not through Cirencester. It takes a more direct though rather steeper route from London than did the old road that went through Oxford, going

Photochrom Co.

FIG. 7. VIEW OF STROUD.

by way of the vale of the White Horse and entering the Stroud valley south of Cirencester.

The Stour-Evenlode Route. The way by the Stour valley to the Severn plain is much less easy. The approach by the valley of the Evenlode winds about and lengthens the distance considerably, and by the more direct way you must rise over 700 feet. The chief place in the valley, Shipston-on-Stour, has never grown to be more than a large village with less than 2,000 inhabitants, a fact which proves the lesser importance of this way across the uplands.

The Bristol Avon Gap. Before leaving the study of the towns that have grown up in the valley ways it will be well to notice the deep gap cut by the Bristol Avon, though this gap is not strictly within our limits. Here we have a way leading to the Severn estuary, to the position of the great port of the west giving access to this important arm of the sea. Bath stands right in this gateway, which is rather narrow and very low, and therefore apt to be marshy before artificial methods of drainage were used. For this reason, and because it is rather circuitous, this gap was not so much used as those gaps farther north as a route to the western plain. The great highroad to Bristol preferred to climb the hills to the north of it, and passed through Marshfield, thus taking almost a straight line to Bristol. Nevertheless, Bath is one of the most famous towns of the kingdom, not so much because of its position in a gap, but because at the foot of the limestone hills here hot mineral springs rise of special medical value. The Romans discovered them soon after they entered Britain in the first century of our era. The magnificent baths that they built to make use of these springs are a sight that now attracts as many visitors as the springs them-

selves. Bath, like the other towns round the uplands, took to cloth-weaving in the fifteenth and sixteenth centuries, but the industry has not survived modern industrial changes, and the springs now, as in the old days, control the development of the town.

Market Towns of the Plateau. These valley and

Photograph by H. W. Taunt & Co.

FIG. 8. AN UPLAND TOWN : CHIPPING CAMPDEN.
Notice the fine Church Tower.

gap towns did not supply quite all the needs of the neighbourhood. It was the upland pastures which produced the sheep, and some centres were therefore wanted on the uplands as markets for the buying and selling of wool which could be easily reached from all the country round. To these markets the great wool merchants used to come to buy fleeces for export at the times of the great fairs. There were four of these upland market centres, Chipping Camden, Chipping

Norton, Stow-on-the-Wold, and Northleach. The wealth which the wool of the splendid Cotswold pastures brought to those who traded with it, is seen in the beautiful churches built by some of the great merchants in the fifteenth and sixteenth centuries. The most famous are those of Chipping Camden and Northleach. Some of the finest work of the period may be seen in these great buildings, now much too large for the towns, which indeed began to decay soon after they were built. Their special importance as markets was over as soon as the wool ceased to be exported and was manufactured at home. Being on the upland they were not near water power strong enough to allow of weaving on any large scale, and they have become less and less important. This is especially true of Northleach, which stands right in the centre of the Cotswolds on one of the widest stretches of upland. It is not near any easy route across the region, and has been left stranded by the railway, while Stow, Chipping Camden, and Chipping Norton have been given a fresh start in life by the coming of the railroad, and have increased slightly in size in the last few years.

Cotswold Stone. Any one who is accustomed to live in a clay lowland like that of the Oxford plain will notice one thing that seems strange to them in the Cotswold towns and villages. All the houses are built of stone and roofed with stone tiles. This stone is grey with a warm yellow tint in it, and it is used for everything in these parts. There are no green hedges gay with flowers in summer here to divide the fields as in the lowlands, but bare stone walls, and the barns and other farm buildings are all of stone. It is the oolitic limestone of which the upland itself is formed, and therefore it is always at hand in large quantities, and

excellent for building. It is sufficiently hard for road-making, and most of the Cotswold roads are made of it, and harder road-metal from other parts is only brought for the few main highways that cross the region.

The Character of the Cotswold Villages. The villages lying mostly, as we saw, in the deep narrow valleys are long and spreading to suit the nature of the

Photograph by H. W. Taunt & Co.

FIG. 9. A COTSWOLD RIVER VILLAGE: BIBURY ON THE COLN. The houses are in a single line close to the river with only the road between.

ground, and also that each house may be as near the source of water-supply as possible, all their water coming from the river direct and not from springs and wells. The houses are not grouped round centres as in more open situations. It is on the flat plains that such villages are found, or sometimes out on the uplands above the valleys. In almost every way then, the

geography of the region decides how the people shall live, what they shall do, and even controls the building and placing of houses.

One other thing very noticeable about many of the Cotswold villages is, that there is very little in the way of green about them. The cottages do not generally have gardens, for flowers do not grow well in the dry soil, and when there are gardens they, like the fields, have stone walls round them. There are few creepers growing over the houses, so that the general appearance is rather bare, and is a great contrast to the pretty lowland villages brightened by the flowers in the gardens, and their thatched cottages covered with Virginia creeper, ivy, vine or hop. But the stone houses are strong and well built, and keep out the cold and wet better than the wood and plaster houses so often seen in the lowlands. Sometimes the new houses in the Cotswolds are built of bricks brought up from the clay plains where they are made. These red brick buildings do not suit with the stone of the district, and spoil the look of the villages, for the plain stone houses seem to fit in with the general landscape and therefore are right and appropriate in this country.

CHAPTER VI

COTSWOLD ROADS AND RAILROADS

If you look at a map of the roads of the Cotswolds you will notice one rather unusual thing about them. The main roads seem often to avoid going through the villages. The highroad from Witney to Cheltenham is especially noticeable. In its whole twenty-six miles it only passes through two places, Northleach and Andoversford, though just off it are at least twelve villages. The road that leads from Burford by Stow to the foot of the escarpment at Broadway, and many others as well, likewise leave the villages on one side. Now the usual aim of a road is to connect places with each other, so that these roads must have some other object in view.

Old and New Roads. The fact is that the present highroads are comparatively new (late eighteenth century), and when they were made the Cotswolds, as we saw, were no longer of much importance in themselves, and the object of the traffic was to get across the region as quickly as possible, not to stop within it. Now the towns and villages, which follow the windings of the rivers, do not lie on the shortest routes, except in the case of the two main valley ways, and hence the roads keep away from them on the higher ground where they can take a straight course. The roads running from village to village are narrower, older, and less well made. They were built in the period when Cotswold wool was all important, and there was much coming and going between the places. It is also easier to make

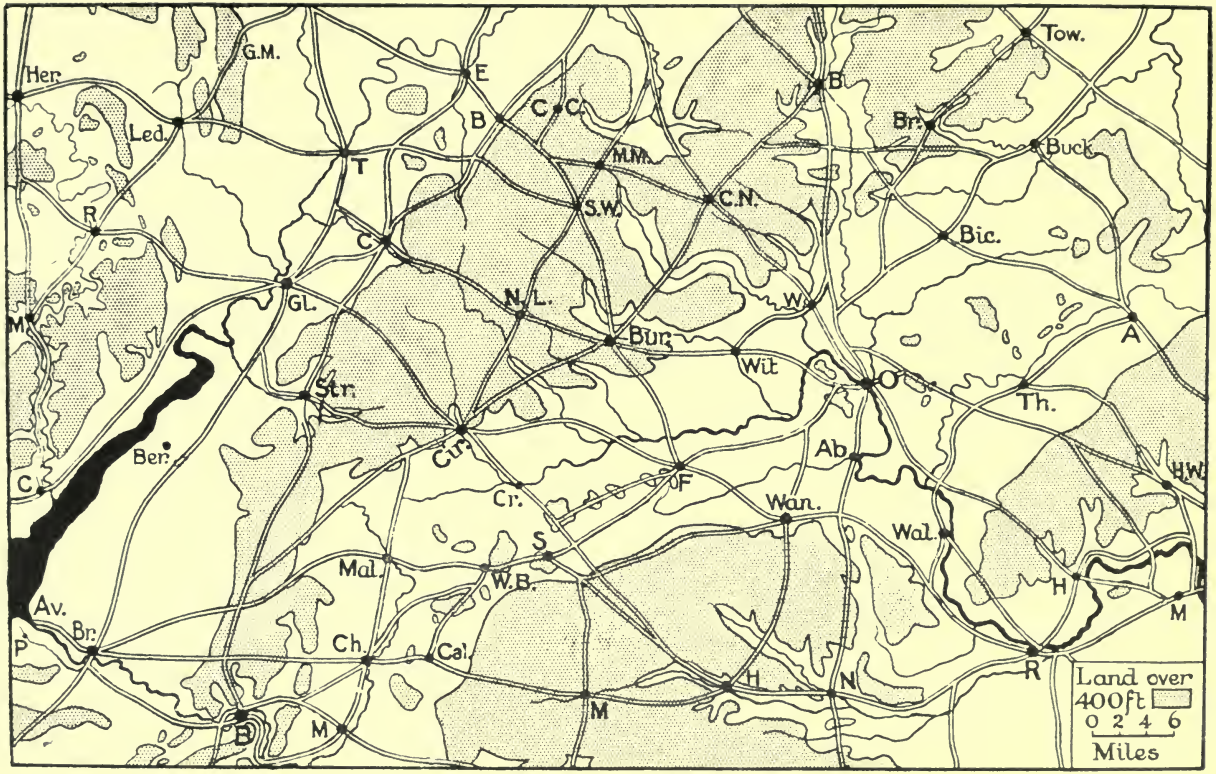


FIG. 10. HIGHROADS.

roads on the plateau because of the greater hardness of the surface. In the valleys, especially in the lower parts, the ground is sometimes damp and soft. The villages even have to avoid being right on the river in some of the valleys, and run in a line along the slopes above.

Another interesting thing to notice is, that the long

Photograph by H. W. Taunt & Co.

FIG. 11. THE WINDRUSH VALLEY. This shows the depth and steepness of the Cotswold valleys: the steepness of the slope shows best on the right-hand side.

south-eastern valleys in which the villages are built are not as a rule connected with each other by properly made roads, except in the lower parts where they approach the plain. The reason, of course, is to be found in the great steepness of the sides of these deeply cut valleys, which make it such a climb to get in and out of them from the upland above. There is the same

absence of lengthwise roads in the Chilterns and White Horse Downs for the same reason.

Railroads. The railways make more use of the valleys than the roads do, being built on embankments in the marshy parts and crossing the rivers frequently in order to cut off meanders. The three lines that cross the region direct follow the gaps of the Stroud Water, and the Evenlode-Stour, and the Cherwell valley. The existence of the town of Cheltenham (see p. 89) at the foot of one of the high notches in the escarpment led to the making of a railroad there. This branched off from the Evenlode line at Kingham, and made the best way it could across the upland to near the head of the Colne valley at Andoversford, and, tunnelling through the highest bit of the escarpment, runs down the steep valley of the Chelt to the Severn plain. From Kingham this line is continued north-eastward, along a depression in the upland (see pp. 18, 33), to the Cherwell valley near Banbury. (For Map of Railways, see Fig. 18.)

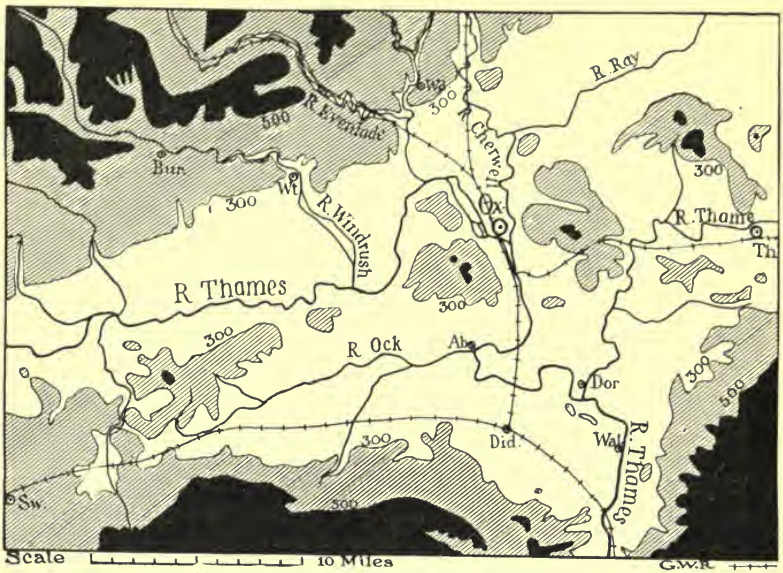


FIG. 12. THE OXFORD PLAIN: PHYSICAL.

FIG. 13. THE OXFORD PLAIN: GEOLOGICAL.

CHAPTER VII

OXFORD PLAIN

THE VALES OF THE UPPER THAMES AND RAY, OF THE OCK AND THAME

The Clay Belts and the Dividing Heights. The plain of the Upper Thames, between the chalk uplands and the oolitic uplands, is divided into two long narrow strips by a belt of heights running in the same direction as all the other feature lines in this region, from north-east to south-west. The heights are formed of corallian limestone, a much less resistant rock than the oolite of the Cotswolds but belonging to the same geological period. In some cases they are covered with a sandstone known as greensand, making them as high as 800 feet and more. Without this capping the hills are only between 500 and 600 feet. They reproduce the same form as the larger uplands on a small scale, and have a steep slope to the north-west with a gentle slope to the south-east, but are not continuous, being broken into separate hills. The more northerly and wider of the two strips of lowland is formed of Oxford clay and the other of Kimmeridge and Gault clay.

The Main Cross-Valley. Besides being thus divided lengthwise by a line of heights, the plain of the Upper Thames is cut again crosswise by a depression running at right angles to the hills. It is the north to south valley followed by the Lower Cherwell and the Upper Thames after it makes its great south-easterly bend just above Oxford. This depression causes each part of the plain to drain down to the middle, so that one half of the Oxford clay region is drained by the

Upper Thames to the north-east and the other half by the Ray to the south-west, the two streams flowing in the same line but in opposite directions. In the same way the Kimmeridge clay belt is drained by the Ock to the north-east and the Thame to the south-west.

The Upper Thames. All these rivers are flowing over a plain with a very slight slope, and in consequence are slow and take winding routes, being pushed out of the straight course by any small obstacle. Look at the course of the Upper Thames (which since the sixteenth century is sometimes called the Isis) and see how it winds over the plain from Cricklade to Oxford. Besides all the smaller loops, it has to make one great bend to get round Cumnor and Wytham Hills, leaving its proper line but flowing back again into it on the other side and thus nearly surrounding the latter hill. From there it follows the line of the Cherwell, making use of the valley originally cut by this river.

On the flat ground east of Wytham Hill the Thames divides into several channels, making the region very wet and marshy. The river has so little energy that it has only cut its bed down a very little way, and quite a slight rise in the water will make it overflow its banks. The heavy rainfall that causes such overflow will at the same time have saturated the lowlying land near the river, so that water already stands on the surface of the meadows, and the two things together may cause very widespread floods. This flooding may happen after any period of very heavy rainfall, not only along the Thames itself but along all its tributaries in this region.

The Ray, which enters the Cherwell at Islip, has very wide floods. It runs along the edge of a circular and extraordinarily level depression known as Otmoor, lying

lower than the level of the river and consequently soon flooded. When not under water the region makes a rich grazing land, but it is of course useless to try and cultivate it. The Ray valley is not so wide as that of the Thames. It only receives a little drainage from the low corallian escarpment which divides it from the Thame basin.

The Thame is a more important river. It drains the eastern part of the Kimmeridge clay belt, yet it cannot be called anything but a small river, meandering over a flat plain. Viewing the region from one of the hill tops on its edge, the river can be distinguished only by the line of willows planted along its banks.

The Vale of Thame is of a less monotonous nature than the other vales of the clay belt. There are some low detached hills due to patches of sandstone and limestone scattered over it, and they give a greater variety to the landscape. Such are the hill on which Great Milton stands and that between Aylesbury and Cuddington. The monotony of the plain is also broken up in this area by the long fingers that stretch out from the corallian or Oxford heights such as that between Long Crendon and Brill.

The Oxford Heights and the Vale of the White Horse. In the west the corallian escarpment divides the tributaries that flow directly to the Upper Thames from those that flow to the Ock, except in two cases. Two rivers, the Cole and Ray, break northwards through the hills and drain parts of both plains, rising in the lower slopes of the chalk edge on the south. The heights, from which the other tributaries flow off to north and south, are usually bare of trees, like the Cotswold limestone uplands, but in some parts clumps of wood break the line of the ridge. The belt of trees

above Faringdon make a landmark for all the country round, and can easily be distinguished both from the slopes of the Cotswolds and the edge of the White Horse escarpment. Wytham Hill also is well wooded, but the rest of the heights are bare.

The Ock is a sluggish stream, winding across the western part of the Kimmeridge clay belt known as the Vale of the White Horse. Like the Thames on the other side of the corallian hills, it spreads out into several channels and floods the country when heavy prolonged rain occurs.

The floods over all the clay plain occur mostly in autumn and winter, the rainiest seasons in the British Isles. In the case of the Thames some effort has been made to prevent so much overflow from the river. The water-level in the channel is controlled by weirs and locks, made originally in the eighteenth century to assist navigation. The weirs are sloping masonry structures which guide the water out of the main stream into another channel when the river rises above a certain level. When it rises still higher the lock gates or sluices can be opened to let the water flow more rapidly down to the sea, and so get rid of it as quickly as possible. In this way overflow from the Thames can be prevented, except when the rain is especially heavy and continuous, which is likely to be the case more than once in the year.

Valleys of Plain and Uplands. Compare the rivers of the plain with those of the Cotswold uplands and it will be seen that they flow in a direction roughly at right angles to each other. The upland streams are mostly flowing across the country in the direction of the general slope of the land (N.W. to S.E.), a slope that is the result of the tilting of the region (see p. 12). These

are the earlier older rivers. Those in the plain carved out a way for themselves later, and in doing this naturally took that way which offered least resistance and made their valleys along the easily worn clay belts. These belts run in a direction from N.E. to S.W. The rivers have

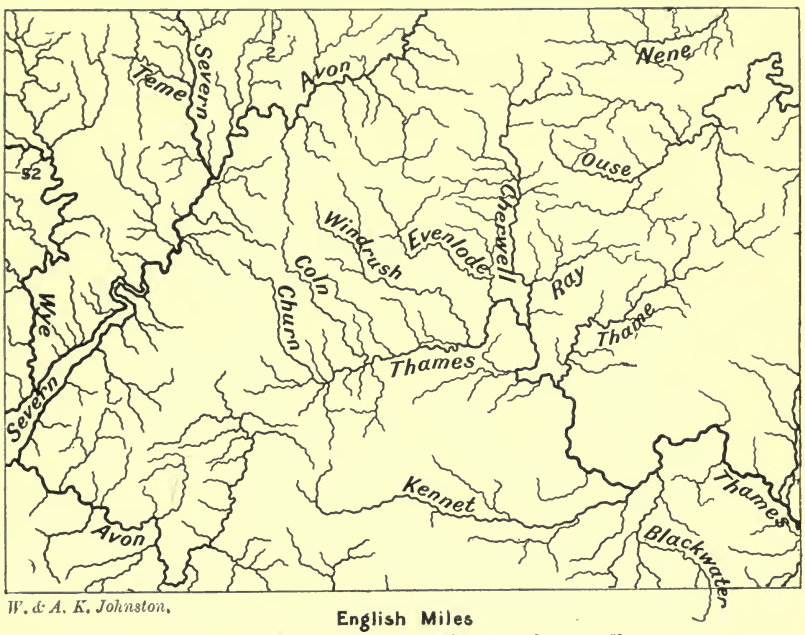


Fig. 14.

thus reduced the clay to the level of a plain and left the hard edges of the uplands standing up above it as an escarpment.

You will notice also in comparing the rivers that there are a good many more streams in the plain than on the uplands, and that there is a great difference in the nature of the two sets of valleys. The rivers of the

plain are flowing in valleys that are wide and shallow, not deeply cut like the valleys we have seen in the Cotswolds and shall see later in the Chilterns and White Horse Downs. A study of the map of rivers shows further that in the upland regions the streams

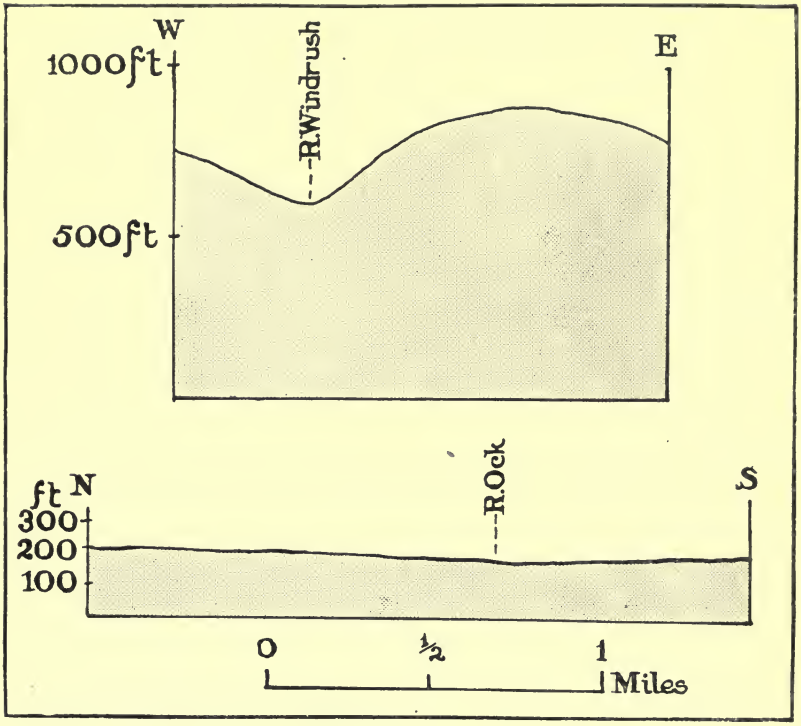


Fig. 15. Sections across River Valleys.

follow well-defined separate lines without many tributaries, but begin to spread out over the country in many streams as soon as they reach the lowlands.

Rivers of Pervious and Impervious Rock. These contrasts in the nature and number of the rivers and their valleys are due to the difference in the nature of

the rock in the different regions. Not only the first great contrast of upland and lowland, but all the other sharp contrasts to be found within the region as well, are due to these contrasts of structure, of the material of which the landscape is made. We shall learn more of these contrasts as we go on with the study of the region. The two chief rock materials are the porous resistant limestone and the impervious non-resistant clay, and it will be clear at once why there are more streams on the clay lowlands than on the limestone uplands. In the latter a large amount of the water sinks away under ground, while in the former it all collects on the surface in a great number of little streams. Besides this, the whole of the clay area is worn down to such an extent that the actual river beds are not so much below the general level as in the upland region, and the rivers are not flowing so swiftly and therefore cannot do the same amount of work in wearing out their valleys. The sections across an upland and a lowland river basin show clearly the difference between the nature and slopes of their valleys.

CHAPTER VIII

OCCUPATIONS OF THE OXFORD PLAIN

In this lowland region a great deal of the land has always been under pasture, from a reason exactly opposite to that which made the Cotswold upland originally grazing land. There it was due to dryness, here it is on account of excess of water. The lowlying parts which suffer from floods are only fit for grass, and the Oxford clay itself is so heavy and cold a soil that it is expensive to cultivate, and for this reason is often left as pasture. But a walk over the Upper Thames plain shows that it is not all pasture land. This is because often, near the river but above flood-level, there are beds of a light gravelly nature which lighten the Oxford clay and make it much easier to cultivate. The Kimmeridge clay is less heavy and contains more plant food than the Oxford clay, and is much more generally used as arable land.

The Ock Valley, or Vale of the White Horse, is especially fertile. The clay is mixed with a lighter soil washed down from the chalk uplands, and the vale has always been an important wheat-growing area except in the flooded portions close to the river. Less wheat is now grown than in the past, as it has become so much less profitable to grow it. Dairy-farming is taking its place, and large quantities of butter and cheese are sent off from there to London.

The Thame Valley, the rich Vale of Aylesbury, is also a dairy region. Here again the clay is mixed with soil from the uplands, and this makes it specially favourable to grass. Though corn would grow excellently the good natural pasture is the most profitable, while

Photograph by H. W. Taunt & Co.

FIG. 16. THE THAME PLAIN, SEEN FROM THE CHILTERN ESCARPMENT.
Notice how flat this clay plain is. It looks prosperous and productive. Compare it with the Severn plain in Fig. 24, and notice how different it is from the bare chalk upland in Fig. 21.

the nearness to London causes a great demand for dairy produce, mainly milk. The train service in this district is arranged to suit the milking hours.

Brick-making. Though this is mainly an agricultural and pastoral region there is one rather widespread industry of the small type, one that exists in all clay plains, and that is brick-making. The demand for building material is always very great, and the Oxford clay makes excellent bricks, so the rather unsightly brick-kilns and chimneys are to be seen very frequently.

Agricultural Life. The nature of the work in this agricultural region depends upon and changes with the seasons, just as in the Cotswolds (see p. 25), or any rural district. But as the climate and the soil differ in the plain and on the uplands, so the times of the various operations are different, and in some respects the nature of the life as well.

The pasture land of the lowlands grows, as we saw, rich grass which not only feeds cattle but also makes good hay, unlike that of the uplands which is only fit for sheep to crop. As there is much grass land in the clay plain, haymaking and dairying both play a large part in the life of the region. The life is on the whole a busier one than on the uplands. To begin with, the dairying gives steady occupation all the year round. Then besides the preparation for, and attention to, the corn crops which generally form some part of the farm economy, in the early summer the hay has to be cut, dried, and stacked. This is a very busy time, and the haymaking is not long over when the corn is ready to be cut, for the harvest comes nearly a month earlier here than in the high Cotswolds. Altogether there is a steadier round of work with fewer slack times than in the less fertile upland country.

CHAPTER IX

TOWNS AND VILLAGES OF THE OXFORD PLAIN

As the physical conditions of this lowland are very different from those of the Cotswolds, it would be expected that the distribution of population would be different. A study of the map of towns and villages soon shows that this is the case. In the lowlands the people avoid the rivers and live away from them on account of the floods. Very few towns and villages are placed actually on the rivers. It is impossible to make good roads or to build houses on ground that is constantly sodden with water. It is interesting to notice the little ring of villages that surrounds Otmoor along the 200 ft. contour line (Fig. 30). These are just above flood-level, and are safe when this lowlying moor is at the mercy of the floods.

If you look at the map you will see there are no roads either along the Thames, the Cherwell, the Thame, or the Ock, and that the roads only cross the rivers at rather long intervals. The best crossing-places were generally where it was possible to ford the stream. At these crossing-places villages have often grown up, and where the circumstances were especially favourable the villages have become towns. The most important of these are Oxford, Abingdon, Thame, and Wallingford.

The Ford Towns. Oxford is built on a very narrow strip of slightly higher ground between the two rivers Thames and Cherwell, where a covering of gravel lies over the clay. In consequence of the narrowness of this

strip, enclosed on either side by the flood plains of the two rivers, Oxford is all length and no breadth. It cannot spread out to east or west, and whenever more houses are wanted the town has to extend to the north or somewhat to the south-east. North Oxford has now nearly reached to the village of Wolvercote, two miles from the centre of the town. The importance of this position is clear, in the very centre of such a valuable agricultural plain, at a point where the two main rivers meet and make the chief gap in the dividing range of hills. The original importance of Oxford was as a market centre for the Upper Thames basin, its growth as a University town was a later and secondary matter, though it is the fact best known about it at the present day.

Abingdon, at the next crossing-place of the Thames below Oxford, is the outlet for the Ock valley and stands at the junction of the two rivers. The ford was replaced by a bridge in 1416, and this added greatly to the importance of the town. By the end of the fifteenth century Abingdon was an important cloth-weaving centre, the sheep of the White Horse Downs supplying the wool.

Wallingford was never so important a town. It stands at a meeting-place of roads coming along the higher slopes of the chalk scarps to cross the river. Its position therefore had some value, but it has not behind it a productive agricultural region like the Vale of the White Horse behind Abingdon. For this reason it did not develop in an economic sense as the latter did, and is now in a state of decay except as a riverside resort in summer.

The Spring Line of Villages. Where must we look for the other towns and villages? A clay plain is not a very good place for habitation, and is nearly always thinly peopled because of the difficulty of getting water.

Photograph by H. W. Taunt & Co.

FIG. 17. VIEW OF OXFORD.

As we saw, there is no lack of water for the crops, in fact there is often too much ; but this water is always on the surface. It cannot sink into the ground (see p. 11), and so there is no store of water underneath. Now the difficulty in the Cotswolds is that the water is too far underground, and the same is naturally true of the chalk uplands for the same reasons. What is evidently wanted is a combination of the two sets of conditions, and this is found at the foot of the escarpment of the Chiltern Hills and the White Horse Downs. Here the impervious clay meets the porous rocks of the uplands, and the moisture that has soaked down through them cannot sink any farther and runs out on the top of the clay as springs. Along this line, then, at the foot of the uplands, we look for the villages and find quite a number of them, as the map will show.

Gap Towns. Another factor has added to the importance of certain of these spring-line villages. The uplands are not very easy to cross, and where the best natural routes over them come down on to the plain there the village has grown into a town. They are Tring, Wendover, Princes Risborough, Watlington, Wantage, and Swindon, the size of the town depending on the ease and importance of the route.

All these, except Watlington and Wantage, are placed at the foot of gaps in the chalk wall of the uplands deep enough to have been chosen for railway routes, and for this reason they have outstripped the other escarpment villages. Swindon has become the largest of all for more artificial reasons. Having some natural advantages as a route centre the Great Western Railway chose it for the site of their engineering works, and this has resulted in the growth of a large and increasing industrial population.

Towns and Villages of the Corallian Belt. The same two sets of circumstances, repeated on a smaller scale, have fixed important villages at intervals along the line of corallian heights that divide the Oxford clay from the Kimmeridge clay plains. There are springs at the foot of these hills, and gaps which in some cases make it easy to take roads across them. But sometimes the gap is so low as to be wet and marshy, and is avoided by both village and road. Faringdon, which might almost be called a small town, stands in one of the higher gaps, a point upon which many roads converge in order to cross the hills by this passage. The other important villages along this line are Shrivenham, Wheatley, and Waddesdon.

Other Villages of the Clay Belts. The only villages actually built on the clay are very small indeed, with only from one to two hundred inhabitants. The rather larger places, such as Eynsham and Bampton, that are right out on the plain of the Thames, are not standing on clay, as might be at first supposed, but on patches of gravel lying on the top of the clay. This gravel is a great advantage, for it allows the rain to sink below the surface, and so prevents the ground from being damp, like the clay soils around; and secondly, the water which sinks through the surface is stopped by the clay, which is not far below, and can be easily reached by shallow wells.

There are two other important centres not yet noticed in the Thame valley, standing on the river, but above the region liable to flood, and on the sandy parts of the valley. These are Thame and Aylesbury, both market centres, the latter becoming industrial at the present time through the removal thither of some London firms for the sake of cheapness. It stands in a line with the

route over the Chilterns by Wendover, and in easy reach of the road through the Tring Gap, while Thame is connected with the route by Princes Risborough.

The Character of the Villages. Just as all the geographical conditions are different in the plain, so the villages are different in character and appearance from those on the uplands (see p. 34). Owing to the difficulty about the water-supply (see p. 54), it may be that a pond is the only thing that some of the small villages have to depend upon for water. In other cases wells may have to be sunk to get at water below the clay, or again, all the houses may depend upon one of the few springs. In all these cases the houses will be grouped round this limited source of supply and form a clustered village. In the middle of the village there is usually a green. A good deal of the life of the village is lived on this green after working hours. It is the gathering place of the children for play and the older people to talk.

The houses are usually made of the clay of the district in some form or other: the older ones in the form of mud, or plaster mixed with wood, of which also there is plenty in the lowlands. The new houses, in those villages that have any new houses, are usually built of clay in the form of bricks. The roofing is very often of thatch, as in this agricultural region straw for thatching is easy to get and tiles have to be made and perhaps brought from a distance.

Everything grows so well in the clay lands that these lowland villages often seem to be smothered in green. Ivy and other creeping plants grow all over the cottages and the gardens are full of flowers. Even in winter the villages look green because there is always a great deal of ivy.

CHAPTER X

COMMUNICATIONS IN THE OXFORD PLAIN

At first sight it might seem as if the roads could be taken quite as easily one way as another over the plain, but a little more thought will show that this is not the case. Good natural routes have to be looked for here just as much as on the uplands. Besides the dangers of floods, which, as we saw, drive the roads away from the river banks, the clay is always soft and sticky when the weather is damp, and any roads over it need constant repair to prevent ruts, and careful ditching to make them at all passable in bad weather. They are never good for heavy traffic, and so the roads naturally run on the better-drained high ground whenever possible.

The Highroads. In what direction are the main roads wanted to go over the Oxford plain? The most important point to which roads must be made is the gap in the hills where Oxford stands, through which of course the great north to south road goes. This is continued northward up the Cherwell valley, but keeps well away from the river. From this route roads branch to right and left: east and west to reach the eastern counties on the one hand, and the Severn plain and Bristol on the other. There are three of these highroads along the plain, none of them following the low lands of the Thames, Ray, Ock or Thame. The main east to west road goes from Oxford along the top of the corallian heights; another follows the higher ground towards the foot of the Cotswolds, and the third runs along the lower slopes of the chalk escarpment in the western half. The sandy nature of

some of the Thame valley allows a road to be taken nearer the river, but not along it.

These lines of east to west roads are connected with each other at intervals across the plain by others running north and south. In the west the Faringdon Gap is chosen as the chief crossing-place on the main central road. A road from Wantage goes northwards by it, and from there two ways branch and connect it with two of the cross-Cotswold valley routes at Fairford and Burford. From Wantage another road is taken across the Ock and Thames lower down and on to Witney, but this is less important because not so good a road, as it has to pass over a wider more lowlying portion of the clay plain. In the east there are also two of these main connecting highways. They pass over the shoulders of the intervening hills, avoiding the high summits, that here reach a height of over five and six hundred feet. One runs through Aylesbury to Bicester, the other through Wheatley and Islip, and thence to join the Oxford-Banbury road.

Railways. The railroads naturally follow the same general directions, north to south and east to west, but not always along the same routes. The railway has not been taken along the line of corallian heights, for instance. The main Great Western line runs instead up the valley of the Ock, about half-way between the river and the escarpment. It was not placed here for choice, because even at this distance from the river the land is low and damp and many embankments had to be made. The railway engineers would rather have laid it higher up nearer the escarpment. But in the days when it was planned people often disliked the idea of railroads, and the villages and towns along the highroad would not have one running through them. So it had to be

FIG. 18. MAP OF RAILWAYS.

carried along the low clay lands. A branch line has been taken part of the way along the foot of the Chiltern escarpment, and another branch along the northern edge of the plain, but only going westward as far as Fairford. Indeed over the greater part of the clay plain there is no railway communication at all.

Waterways. The river Thames, being wide and deep enough for navigation, has helped the development of the plain by offering easy means of transport to London. The main stream is navigable right up to Lechlade for small barges, and heavy or bulky goods are often sent at least part of the way by water. It costs less to send them by water than by rail because the water does not get worn out as the railways do, that have to be constantly repaired.

Thames and Severn Canal. From Lechlade a canal has been cut connecting the Thames with the Severn, passing through the Stroud Gap but having to tunnel under the highest part of the divide. This makes a continuous waterway from the estuary of the Thames to that of the Severn, but the river above Reading and the canal itself is only deep enough for barges drawing not more than 3 feet 6 inches of water even if kept in good condition. This is not the case at the present time, and the river above Oxford and the canal are very little used. The floods in the Upper Thames cause the bed of the river to get silted up, so that in dry weather dredging is needed to keep the channel properly clear, and as this is expensive it is not always done. Then the canal where it crosses the porous limestone rock by Saperton has not been made properly watertight and leaks, so that the full depth of water is seldom present. In consequence of this there is very little through traffic now from Thames to Severn.

But though the Upper Thames does not carry many barges nowadays it is always very full of life in the summer, for a constant stream of pleasure steamers and smaller craft, punts, and boats, comes and goes between Wallingford, Abingdon, and Oxford.

Oxford Canal. There are other waterways in the region. The Cherwell itself is not big enough for navigation, but its valley has been canalized to make a waterway through to the coal and iron district of the Midlands. This is known as the Oxford Canal, and is a little deeper than the Thames and Severn Canal, and allows of 3 feet 8 inches draught and has more traffic than the latter. Barges laden with coal may often be seen at Oxford which have come by this canal, and the grain from the agricultural districts comes this way to the mills on the Thames, being collected at Banbury.

Grand Junction Canal. The Birmingham district has also been connected more directly with London by water by means of the Grand Junction Canal, a wider and more important waterway than the Oxford Canal. This runs farther to the north-east and crosses the Chilterns through the Tring Gap, and it can carry barges of 4 feet draught and 40 tons burden. Some of the barges are worked by steam in this canal.

Berks. and Wilts. Canal. One more canal has been dug in the Oxford plain parallel to the Upper Thames, along the Ock valley from Abingdon and over to the valley of the Bristol Avon. It is a very small narrow canal, and has been allowed to go out of use and become derelict.

CHAPTER XI

THE WHITE HORSE DOWNS

The Chalk Ridges which rise high above the Oxford plain have, as we have already seen, the same general character as the limestone uplands of the Cotswolds. There are the same steep and gentle slopes running in the same direction. The most westerly portion of these uplands will be considered first, the White Horse Downs, separated from the eastern portion, the Chiltern Hills, by the deeply cut valley of the Thames between Reading and Goring.

The White Horse Downs do not keep entirely to the general north-east to south-west direction of the uplands and lowlands of the Upper Thames region. Starting from the west, at the head of the Kennet valley, the escarpment runs at first in the usual line, but about midway it makes a gentle swing round to the east and takes a nearly east to west direction. It is less steep and abrupt than the Cotswold escarpment, with a rounded top and softer outlines, but there are no deeply cut gaps like those made by the Stroud Water and Stour.

Gaps. The escarpment is not unbroken, but the gaps, which appear only near either end, are rather high at the western end, over 500 feet. In the central part of the Downs the high edge is continuous. In its highest portions towards the west it is over 900 feet, but the general height is between 600 and 700 feet. It is slightly indented with hollows, which give it an appearance of bays and cliffs, and these hollows are dry valleys

Photograph by H. W. Taunt & Co.

Fig. 19. The Thames Gap which cuts the chalk upland into two parts.

with no streams in them like those that have notched the Cotswold escarpment. The two chief breaks in the Downs are: in the west, the gap separating Hackpen Hill from the main mass of the uplands, a dry valley; in the east, another waterless depression opening into the Pang valley, a much lower gap, very little over 300 feet in height.

Dry Valleys and Bournes. These dry valleys are always to be found in chalk regions on account of the porous nature of the soil. It is more porous even than the oolitic limestone of the Cotswolds, and the water on the higher levels all sinks away below, leaving the country dry and riverless. It is only on the lower levels that the streams appear. The south-eastern slopes of the White Horse Downs, for instance, are furrowed by many long, deep, steep-sided valleys following the general slope of the land, without any rivers in them for miles, sometimes for as many as eight or ten miles.

The Pang and the Lambourn valleys are the most important of these. The former has its head close to the high escarpment and continues for eight miles to a point marked by the village of Hampstead Norris before the river Pang makes its appearance. The Lambourn is the largest river of the Downs. Its valley also begins near the steep edge of the uplands and opens the way northwards to a small high gap in the escarpment at the foot of which stands the village of Bishopstone. There are a great number of tributary dry valleys, likewise gathering from the escarpment, but the dry course of the Lambourn valley is not so long as the dry course of the Pang valley.

Hackpen Hill, which reproduces the features of the larger Downs on a smaller scale, has its own little series of dry valleys opening to that of the river Og.

Photograph by H. W. Taunt & Co.

FIG. 20. THE ESCARPMENT OF THE DOWNS. Compare the bare crest of the escarpment with the forest-covered edge of the Chilterns. Notice the rich aspect of the plain of the White Horse below.

Dip-slope Streams. The rivers of the south-east, or dip slope, are all (except the Pang) gathered up at the foot of the uplands by the river Kennet, flowing eastward in the same direction as the Upper Thames and Ock. It joins the Thames just after that river has cut its way through the chalk and entered its lower basin. The Pang, instead of continuing its course south-eastwards to the Kennet, has been turned by some obstacle in the direct path and cuts its way due east, and so enters the Thames independently.

These long dip-slope valleys are separated from each other by high narrow ridges of bare treeless Down, and from the valleys that drain to the Ock by the edge of the escarpment. No river has broken its way across the escarpment.

The Kennet, flowing near the foot of the Downs, has a low flat valley cut out along a belt of clay of a kind we have not met with before. This is called London clay, a material that covers nearly the whole of the basin of the Lower Thames. South of the Kennet valley another chalk upland rises, an upland that drains to the south and is therefore beyond the scope of this book. The belt of London clay along which the Kennet has cut its way is narrow compared with the belts of Oxford and Kimmeridge clays, and the river does not meander over a wide plain like the rivers of the other two regions, but its valley is flat and marshy and like them is easily flooded.

Soil. The Chalk Downs are bare and treeless because of the absence of both water and soil. Chalk forms a very thin soil, not good enough to produce anything except grass. But the grass is sweet and good, like that of the limestone uplands, and supports a fine breed of sheep almost as famous as the Cotswold flocks. The grass of

the dry uplands is quite different from the grass of the wetter lowlands. It is very much shorter with narrower blades and fewer flowering species, for there is not sufficient plant food in the soil to nourish the broad rich blades of grass to be seen in the river meadows. For this reason there is not enough nourishment in the upland pasture to feed cattle, only sheep.

Occupations. Of course there are some trees, chiefly beeches and firs, on the Downs, though fewer than on the Cotswolds. These are only to be found where the chalk is covered over with some other material that makes a soil, either clay or gravel. Similar coverings over the chalk make cultivation possible and profitable on some of the lower slopes of the Downs, so the region is not entirely pasture. Oats and wheat are grown in many parts, but sheep-farming is and always has been the most important occupation of the people of this part of Berkshire. This naturally led to some development of the cloth-making industry in the towns below the Downs, such as Abingdon on one side and Newbury on the other.

The low water-meadows of the Kennet valley on the other hand, and the lower valleys of its larger tributaries, produce grass good enough for cattle, and here dairy-farming is all important. Both milk and butter are sent to the London market.

CHAPTER XII

TOWNS AND VILLAGES OF THE DOWNS

As in the Cotswold uplands, the population of the Downs is to be found in long lines by the river banks, separated by uninhabited uplands. There is, of course, the same difficulty in finding water on the chalk as on the limestone, and the population is equally small in either region. The White Horse Downs, like the Cotswolds, is a land of lonely roads and solitary spaces. All the villages are to be found in the valleys, and the few towns are all valley centres, places where two or more such natural routes meet. The villages are all small, and placed close to each other along the valleys. The most important places are, of course, on the Kennet itself, at points where the rivers of the Downs join the main stream (see Fig. 30).

Newbury and the Kennet Valley Routes. Of these towns Newbury is the largest. Here the Lambourn valley and an important tributary from the north-east, which leads to the eastern gap in the escarpment, open into the Kennet valley so that three routes meet at this spot. By the sixteenth century Newbury had become important as a cloth-weaving as well as an agricultural centre, and was very prosperous. The Downs supplied wool and water power, and the town had an easy outlet to London down the Thames from Reading. A look at the map showing heights will make it clear that the Kennet valley offered an easy outlet towards the east, but as a westward route it was not nearly so good, for the Downs north and south of it close round towards the head of the valley and a stretch of upland 550 feet high

has to be crossed to reach the Avon valley and the way to Bristol. For all that, the valley is so directly in a line with London and the Bath Gap leading to Bristol that a great highroad went along it.

Marlborough is the town placed near the head of the valley at the entrance of the gap between Hackpen Hill

Photograph by H. W. Taunt & Co.

Fig. 21. The White Horse Downs. This shows the gentle slope of the Downs, the absence of trees, and the lonely road.

and the main mass of the Downs. Here, then, an important north to south route crosses the east to west valley and Marlborough stands on the cross-roads. It is an upland town more than 500 feet above sea-level. Though never a very large town, it was important long ago because of its position where the London-Bristol road is crossed by that from Southampton to Gloucester. Before the coming of railroads as many as forty-two

coaches stopped in Marlborough daily on their way to and from London. It was also an agricultural centre and a market town, and this it is still although it is no longer a centre of through traffic. The Great Western Railway has diverted that, having found an easier way to the west than through Marlborough. This way is longer than the old direct road, but a railway does not mind a little greater distance if the route is less steep as in this case.

Other Towns and Villages. Between Marlborough and Newbury lies Hungerford, at the junction of the Bedwyn Brook valley with the Kennet valley, and near that of the Aldbourne. The Bedwyn valley forms an important route leading over to the Vale of Pewsey and so south-westward. But Hungerford, like the other towns of the Kennet valley, is no longer of much importance. They are all in a state of decay and lifelessness, in spite of the Great Western Railway which passes through them, a line along which are run the fastest expresses to Devon and Cornwall. This route is used by the railway company simply as being the shortest way between London and the south-west, and the trains rush along in a hurry to get on and leave the towns of the region just as they found them, unaltered by their passage.

With the exception of Marlborough there is no place large enough to be called a town on the Downs, and the only two big villages are Aldbourne and Lambourn. Aldbourne is on the highway across the Downs to Swindon by the Bishopstone Gap, but Lambourn, though on no through route, is the larger place, serving as a collecting centre for the uplands and valleys around. It can send goods easily down the valley to Newbury, especially since the little railway has been run to it

from that town. Lambourn is placed where the dry portion of the valley ends and the river appears, giving a sufficient water-supply, easy to reach, and where also several tributary valleys meet.

Reading. The region where the Kennet joins the Thames is not strictly within our limits, for here the latter river has reached its lower basin. All the same, it should be noticed that the junction of these two rivers at the point where the Thames leaves its narrow passage through the chalk and comes out into a wide plain again, adds very much to the importance of the town, which has naturally grown up to command the passage way. This town, Reading, owing to its position, was sure to be important at any period of our history. It was the fortress which guarded the one good gateway in the chalk wall that shuts off London from the Midlands. Hence it has suffered in any Civil War, standing attack and siege, for in a Civil War the command of the best road to London, the capital, is all-important to both parties.

The time of the Great Rebellion of the seventeenth century brought the greatest and most lasting disaster of all to Reading. Since the fourteenth century the town had been one of the leading cloth-making centres of the kingdom, but the industry was destroyed during these wars and the town took long to recover. The woollen industry never returned to this region (see p. 25), but Reading is now again a thriving, growing town of 65,000 inhabitants.

Battles at Newbury. It is quite easy to see why there were two important battles near Newbury during these same great Civil Wars. The Kennet valley route is one of the two chief highways from London to the west, to the region beyond the Chiltern

escarpment and beyond the Cotswold escarpment. This is, of course, the broad plain of the Severn, a lowland that has a way open to the north by the Cheshire plain and is for these reasons a convenient collecting place for an army hostile to the power at London. The other way to this plain through the Reading Gap and north of the Downs along the Oxford plain and across the Cotswolds by the Stroud Gap is the easier and more direct way to Gloucester, the centre of the Lower Severn valley; but if this route is blocked an army would then take the Kennet route south of the Downs. This is what the Parliamentary army had to do in 1643. Its leaders were then in power in London, and had sent a force westwards to prevent Gloucester from falling into the king's hands. This it did, and wanting afterwards to return to the capital had the Royalist army, centred in Oxford, behind it, blocking the northern road to Reading through the Thames Gap. The Parliamentarians therefore made for the Kennet route, and the Royalists moving south across the Downs to try and stop that way too, the armies met near Newbury, and the Parliamentarians had to fight their way through to London. The next year the same kind of thing happened, only this time it was the king's army that was coming from the west and that of the Parliament which tried to intercept him in the Kennet valley, and so the second battle of Newbury was fought.

CHAPTER XIII

ROADS AND RAILWAYS OF THE DOWNS

The White Horse Downs are not crossed and recrossed by traffic as the Cotswold uplands are, for they do not stand so directly in the way of movement between London and the West. There are not such good natural routes over them either, and at the same time the Thames Gap offers such an easy way from the Lower Thames valley to the north and west that it attracts all the traffic in these directions.

The natural routes across the Downs along the river valleys have already been considered, and they are all followed by highroads. The roads are good, for the rock material is excellent for their making, flints, which form the best possible road-metal, being at hand in the chalk. In the clay valley of the Kennet, you find, as in the other clay valleys, that the road does not follow the river, but keeps well away from it above the low water-meadows.

One other highroad has been taken right over the Downs. This climbs the escarpment behind Wantage and connects it with Hungerford, following a narrow dry valley after crossing the high belt of upland at the top of the escarpment. This road has added greatly to the importance of Wantage.

Railways. The main east to west route by the Kennet is also made use of for a railway that follows the river as far as Hungerford, taking then the valley to the south-westward and crossing to the Vale of Pewsey.

This is an easier route for the line than continuing straight on to Marlborough, as the road does, and so going westward to the Avon valley, for the rise of the ground is much greater that way. From this east to west railway another line is sent to Marlborough, passing on northwards through the western gap in the Downs to Swindon, and on still through the Stroud Gap in the Cotswolds to Gloucester.

Only one other railway crosses the Downs, and this is right at the other end, in the east, following the only other deep continuous gap. This line connects Didcot and Newbury and continues southwards to Southampton. It is noticeable that the road has avoided the gap and runs parallel to the rail but 200 feet above it, where it finds a firmer drier soil and also can follow a more direct north and south line. At Didcot this railway joins the main line running through the Thames Gap to Oxford.

The whole region of the White Horse Downs is a region of quiet unchanging life. A fine healthy country, open and treeless and therefore getting all the sun and air unchecked, it maintains a moderate and steady prosperity. The stir of modern life and the movement of people to and from London rushes round it, through the Reading Gap and along the Kennet route, and leaves it untouched and unprogressive.

CHAPTER XIV

CHILTERN HILLS

The Chilterns, or the eastern portion of the chalk heights overlooking the valley of the Thame, have an escarpment more like that of the Cotswolds than like the White Horse Downs. They stand up steeply with a sharp edge, rising to a height of 700 and 800 feet, running in a straight line from the Thames Gap away to the north-eastward. The limit of the Chilterns in this direction is not very marked. The chalk belt gets lower and lower towards the north-east, but continues right on to the coast of Norfolk under various names. The higher part of this chalk belt, which is called the Chilterns, may be taken to end at the break in the high ground where Luton is situated, but we shall confine our attention almost entirely to the part south-west of Tring and Berkhampstead. North-eastward of that the escarpment does not drain to the Upper Thames but to the Ouse, and so to the Wash.

Gaps. The Chiltern escarpment is in many ways unlike that of the White Horse Downs. For instance, it is broken by a number of gaps giving passage ways across the uplands. As these are all dry gaps with no rivers to give them names, we may call them after the towns that command their entrance. Beginning at the south-west they are, the Princes Risborough Gap, the Wendover Gap, the Tring Gap, and the Dunstable Gap. This last is higher than the others and less important, and has not been used for a railway as all the others have, though a Roman road was taken through it.

Stretching south-eastward from the edge of the escarpment is a belt of upland with an almost imperceptible slope, such as is found on the Cotswolds, but so much of this upland is covered with woods that it is difficult to get a good view of the landscape. There are not the wide open sweeps of country that are the great feature of both the Cotswolds and the Downs, and the crest of the escarpment is crowned for the greater part by a line of trees. This is another contrast to the bare edge of the White Horse Downs.

Trees. It seems strange to see so many trees on a chalk country! Their presence is due to the fact that there are many patches of clay on the top of the chalk. This clay belongs to the same geological period as the London clay of the Lower Thames basin, and it once covered the whole of the Chiltern region, only all the rest has been worn away.

Going south-eastward from the escarpment, the belt of upland soon becomes divided into broad ridges with gently rounded tops, separated by deep valleys. Now these south-eastern slopes of the Chilterns do not belong to the basin of the Upper Thames, for only the steep north-western slope of the escarpment drains to that valley; but it is impossible to study the escarpment properly without the upland to which it forms the edge. It would be absurd to take an edge of anything all by itself, and so we must give a little time to understanding the geography of the whole Chiltern region.

Dry Valleys and Bournes. Nearly all the higher parts of the Chiltern valleys are waterless, like the valleys of the White Horse Downs, and some, like those, are dry for their whole length. The largest of them is the valley that opens to the Thames by Henley. The Hambledon brook close to it does not always flow. If

Photograph by H. W. Taunt & Co.

FIG. 22. THE CHILTERN ESCARPMENT. The woods are beech woods. Cf. Fig. 20.

there is less rainfall than usual in the winter, it will run dry before the summer is over.

Dip-slope Streams. There are quite a number of south-eastward-flowing streams in the Chilterns. The most important, going from south to north, are: the Wye, Misbourne, Chess, Gade, Colne, and Lea, and all their waters are gathered up at the foot of the chalk by the Lower Thames and carried away eastward to London. Their valleys are cut down far into the chalk, and have steep sloping sides, and a section across one of them would be like that on page 46.

Pasture and Arable Land. Now wherever the chalk, with its thin soil, is exposed (see p. 66) the Chiltern region is covered with the short sweet upland grass; but, as we saw, the Chiltern chalk is often covered with clay and then the soil is quite fertile. For this reason the inhabitants of these uplands are not so largely employed in sheep-farming as in the other chalk region, and there is quite a fair amount of agricultural work in the region.

Population. Taken as a whole, the population of the Chilterns, as might be expected from its nearness to London and its greater ease of communication, is much larger than that of the Berkshire Downs, but there are considerable contrasts in this matter in the different parts. In the regions where the chalk is not covered there is the usual difficulty about the supply of water. Here the inhabitants have to depend mainly on rain-water, collected in tanks, and of course the quantity of this supply is very uncertain, so that it is no good for a large number of people to depend upon it. The villages find their opportunity to grow big, however, down in the valleys and, as in the Cotswolds, where the valleys begin to widen out on to the plain the villages

have grown to be towns. In this Chiltern region the valleys open to the plain of the *Lower* Thames instead of the *Upper* Thames, and because of this, the towns are much larger than the market towns of the Cotswold edge (Witney, Fairford, &c.). They are near London, and are easily reached from it, being on the main routes leading northwards (see Fig. 30).

Valley Entrance Towns. At the entrance of those valleys most directly north of London the largest towns have developed. They are St. Albans, where the Colne begins to leave the uplands, and Watford still nearer its mouth, and Hemel Hempstead, where the valley of the Gade opens out. Going south-westwards the towns become smaller. There is Rickmansworth at the mouth of the Chess valley, Amersham where that of the Misbourne begins to widen, and Beaconsfield near the opening of the Wye valley, with High Wycombe a little higher up. As all these valleys lead down from the gaps in the escarpment, they are much used for traffic, and the villages standing in the higher parts benefit by this also, and have sometimes grown to a fair size and importance. Such are Berkhampstead and Missenden. Like the villages of the Cotswold valleys and those of the White Horse Downs, these towns are 'long' towns to fit into the narrow valleys. Some are old woollen centres, markets for the sale of the Chiltern fleeces. Great Missenden in the thirteenth and fourteenth centuries was especially famous for its wool sales.

Routes. The natural routes across this region can be easily seen. They go along the river valleys and through the gaps in the escarpment to the plain below, and roads and railways alike follow them. It is very difficult to go lengthwise in the high Chilterns, in fact there is no road at all that way along the upland. Any

such road would have a much too difficult way to go, climbing down and up the many steep valley sides it would meet in its course. It is only when the lower slopes are reached and the valleys have become shallow that a highroad is found running from north-east to south-west. It goes from Berkhampstead to Chesham,

Photograph by H. W. Taunt & Co.

Fig. 23. A chalk valley, deeply cut like those of the Cotswolds.

Amersham, High Wycombe, and down to the Thames at Marlow.

In spite of the geographical likeness of the Chiltern region to the other uplands of the Thames valley the nearness to London has made its present condition very different. London has grown so big that it is now stretching out long fingers and reaching up the Chiltern valleys and even on to the upland. The peace of the country has been disturbed, and there is not the

same feeling of quietness and of distance from the busy world that is found in the Berkshire Downs on the other side of the Thames Gap. In some parts of the highest Chilterns, indeed, especially in the south-west, there are lonely stretches of quiet country, but they are far fewer and their influence does not spread over the whole region as in the case of the other upland.

CHAPTER XV

THE SEVERN–AVON VALLEY

The Clay Vales of Avon and Severn. We have considered the two upland belts of our region, and one of the lowlands; there is now the second lowland to study, the most westerly of the natural divisions. It lies at the foot of the Cotswold escarpment, and is drained by the Avon and the Severn. It is remote from London, and is a real West-country region. Its main outlet is westwards by the Bristol Channel. The lines of communication with London are, as we saw, limited and not very easy. They lead across the Cotswold uplands to the Oxford plain, and then across the Chilterns to the London basin.

This Severn-Avon Valley is formed of Lias clay, and is bordered on the west by heights made of a kind of resistant rock which we have not met with in our Upper Thames region. It is sandstone, and it is resistant because, like limestone, it is porous (see p. 12).

The Bordering Uplands. The uplands that bound the southern part of the plain (the Lower Severn Valley) are higher than those in the north, and are made of the older rock, which is called Old Red Sandstone. The Avon Valley is bordered by New Red Sandstone hills, much lower and less conspicuous. These uplands are not bare like the limestone regions but are covered with forests, mostly of fir and beech, for the sandstone is rather dry. The woods of the Old Red Sandstone heights are very fine, and the region is known as the Forest of Dean.

The Three Vales. The upper part of the lowland —the Valley of the Avon—is known as the Vale of Evesham, the middle part as the Vale of Gloucester, and the lower part the Vale of Berkeley, each called after the town that has grown up as its centre. The lower vale is not entirely formed of clay. In some parts older rock, that is generally covered by the younger deposits, has been pushed up and comes to the surface. This rock is called carboniferous, and it contains layers of coal within it. For some miles along the floor of the Vale of Berkeley these carboniferous limestone and coal measures lie, and the fact of their presence has made a great difference in the modern history of the region. Coal measures appear again in the Forest of Dean on the other side of the River Severn.

The whole of the plain lies very low. The higher part, drained by the Avon, is only between 100 and 200 feet above sea-level, while the Vales of Gloucester and Berkeley are less than 100 feet high, consequently the rivers meander about over the flat land, and make it damp and marshy by constant floods such as occur in the Oxford plain.

The River Severn. The Lower Severn as it wanders through the Vale of Gloucester breaks into several channels, making a wide belt of water-logged land difficult to cross. The river also brings down to its lower course a large quantity of mud and deposits it in the estuary, where it forms shoals and sandbanks that make navigation difficult, so that the Severn has never been very important as a waterway. Hence the chief port of the region, Bristol, grew up at the mouth of a river that opens into the estuary quite low down, where the sandbanks end and deep water begins. It is only the cutting of a canal in recent times that has made Gloucester into a port to which large steamers can ascend.

The Avon Vale. The Vale of Evesham, or the Valley of the Avon, may be divided into two parts, an upper and a lower. The upper part, which ends at the River Stour, is wider than the lower part, for the escarpment on its southern side stands farther back. As we saw in studying the Cotswolds uplands, the limestone that forms the edge south of the Stour is here worn away, and a marlstone that was beneath it is exposed and makes the escarpment, the Edgehill as it is called. This wider valley is divided again, lengthwise, by a low line of hills running in a north-easterly direction, in a line with the escarpment south of the River Stour. The valley between these hills and Edgehill is known as the Vale of the Red Horse, and Kineton is the centre of it.

In the Lower Avon Valley the most conspicuous feature is a high detached hill standing up in the plain with a steep slope to the north-west and a more gradual one to the south-east. It is called Bredon Hill, and is formed of a detached portion of the oolitic limestone

By permission of the Great Western Railway.

FIG. 24. VIEW FROM COTSWOLD ESCARPMENT.

of the Cotswolds. Nearer the escarpment are two more limestone hills of the same kind but much smaller. They are Alderton Hill and Oxenton Hill.

The heights that border the Avon plain on the north are low, with a gentle slope, and are not conspicuous features like the steep edge of the uplands on the other side.

The Forest of Dean. The middle part of this western lowland region, the Vale of Gloucester, has, as we saw, a much more marked boundary, the upland of the Forest of Dean. This upland, formed of Old Red Sandstone, extends all along the right bank of the Severn as far as the mouth of the River Usk, but it is cut in two parts by the River Wye, which has worn out a deep, narrow, and very beautiful valley across it from Monmouth to Chepstow. The whole region is covered with forests, firs and beeches; but the name Forest of Dean is given only to the part east of the deep Wye Valley which makes such a marked dividing line, and only this part is included in the County of Gloucester. In early days the forest was the cause of great trouble to the people living in the plain. Its thick woods, much thicker than now, gave fine shelter to bands of robbers who used to fall upon and rob the people of the lowland. They were so troublesome that in the reign of Henry VI an Act of Parliament was passed authorizing strong measures for their suppression.

The Vale of Gloucester. The valley between the Forest and the Cotswold edge is very level. It is not divided as the Avon vale is by any line or belt of heights. Near the west bank of the river there are a few gentle swellings rising to 200 feet and a little over, but they are very gradual in slope and inconspicuous. Viewed from the top of the Cotswold escarpment

the plain has an absolutely flat appearance, but it is well wooded and looks fertile and prosperous (Fig. 24).

The Vale of Berkeley. The third section of the plain, the Vale of Berkeley, lies very low. It is nearly all below the 50 feet contour line—a line which runs at a distance of from 3 to 4 miles from the shore of the Severn estuary. This belt of low marshy land is formed of soft alluvium, that is, soil that has been laid down by rivers, and it ends where a small portion of carboniferous limestone is pushed up above the surface and forms a low line of hills nearly 300 feet high. Behind this a slightly higher plain stretches to the foot of the Cotswold upland. The Vale of Berkeley then, like the Vale of Evesham, is divided into two long strips, one at a higher level than the other. In both cases the dividing hills are low, but are sufficient to divide the drainage, and the rivers run off on either side of them.

CHAPTER XVI

OCCUPATIONS OF THE SEVERN-AVON VALLEY

Considering this Severn-Avon lowland as a whole, we find there is a much greater variety of occupation than on the Oxford plain. A good deal of it, of course, like the low-lying parts of the Oxford clay plain, has always been pasture-land, for the same reasons (see p. 48). The belt along the rivers is too liable to floods to be fit for agriculture, but, owing to the amount of moisture, it produces a rich grass very good for cattle. The clay soil above the flood-level is fertile, and in past times was largely used for wheat-growing, but ploughing on heavy clay lands does not pay as well as it used, and a great deal of this region is now grass land. In the Vale of the Red Horse the clay is lightened and improved by soil washed down from the uplands, and this makes it both productive and easily cultivated, and here much corn is still grown. The character of this valley is like that of the Vales of Aylesbury and the White Horse.

Those parts of the loamy Lias clay soils of the Vales of Evesham and Gloucester that are cultivated are used for special small crops, such as hops and orchard fruit. From the latter cider and perry are made, and the making forms an important industry in the Vale of Evesham. In the Vale of Gloucester, where the soil is stiffer and colder than in the Avon Valley, dairying is the most important occupation, Bristol and Gloucester consuming large quantities of milk. Before the eighteenth century tobacco used to be an important crop in

these parts, but to the great indignation of the inhabitants its cultivation was forbidden by law when the colonists over in Virginia began to grow tobacco. The people were so angry at this forcible suppression of their favourite crop that there was considerable trouble and some tobacco riots before they submitted.

In the Vale of Berkeley, the region bordering the Severn estuary, things are very different. The reason for this difference is to be found in the fact that the carboniferous rock is here (see p. 86), containing coal. The result is some industrial development, mainly of iron manufacture, with iron from the Forest of Dean, which is carried on at Bristol itself and some of the smaller towns, such as Dursley, at the foot of the Cotswold escarpment. This was originally a cloth-making town, as were all the other small towns, now of no importance, near the uplands here, as well as in the other regions we have been considering. It is not very far from the still-important woollen centre of Stroud.

The low-lying pasture lands near the estuary support a great number of cattle, and this part of the vale is famous for its cheese, for which Berkeley is the chief market centre. Though once occupied in cloth-making, Berkeley has never been more than a small agricultural centre, and has no modern importance. In the twelfth century the vale was famous for its vineyards, from the grapes of which a very sweet wine was made, the best in England. In the centuries after the Norman Conquest all the southern counties of England made some wine, for the climate is quite warm enough to ripen a small grape, and as the Normans were accustomed to make wine in their own country they brought the custom over to England with them.

CHAPTER XVII

TOWNS AND VILLAGES OF THE SEVERN-AVON PLAIN

The physical conditions in the Severn-Avon plain being much the same as in the Oxford plain, it follows that the distribution of population will be alike in the two regions, for there are the same kind of advantages and disadvantages to affect the placing of villages and towns. There is a line of little towns along the foot of the Cotswold escarpment where a good water-supply can be found, just as there is along the steep foot of the Chilterns and White Horse Downs. The more important of these stand where the natural routes across the upland come down on to the plain (see Fig. 30).

Gap and Scarp Towns. The towns right in the two chief gaps of the Cotswolds, Stroud and Shipston-on-Stour, have been already considered with the uplands; the most important of the other escarpment towns are (starting from the north) Fenny Compton, Broadway, Winchcombe, Cheltenham, Dursley, and Chipping Sodbury. These are all old market towns, and with the exception of Cheltenham and Dursley are quiet little country places of small importance at the present time. Dursley, as we saw, has developed a modern iron manufactory, and Cheltenham has grown to a large town on account of some mineral springs discovered there in the eighteenth century. It also stands at the foot of the best of the few high gaps that are cut into the wall of the escarpment by the small rivers that flow to the

Severn between the Stroud and Stour routes, and has a very sheltered position.

Ford Towns. Again, like the Oxford plain, there is a second line of towns parallel to those at the foot of the hills at intervals along the main rivers. They are placed at the crossing-places, or where slightly higher ground makes it dry enough to build close to the river, otherwise the river is avoided by villages and towns and also by the roads. Stratford is the first place on the Avon within our region. Below that the only settlements on the river are two tiny villages till Evesham is reached, a distance of about 18 miles.

The Position of Evesham. Here a tongue of higher ground runs down into a bend of the Avon on the northern side, making high banks well above the river at a little distance from it, and on this strip a town grew up in very early days. The position of Evesham is important, because just below it the Avon makes its way between two stretches of higher hilly ground, so that the town is in a position to defend one entrance into the Upper Avon Valley. This fact explains why the battle of Evesham was fought during the Barons' War in the thirteenth century. Then, as in all civil wars (see p. 72), the west country, the Severn Valley was the centre of one party and the east with London the centre of the other. The baronial party, led by Simon de Montfort, was ruling then at London, and went westward to attack the adherents of Prince Edward on the Welsh border, and in returning, having crossed the Severn near Worcester, it was making its way eastwards by the Avon route and was cut off at the passage of Evesham.

Stratford and Evesham are both important centres for the Vale of Evesham, Stratford for the upper half and Evesham for the lower. They are both flourishing

little market towns now as they have been in the past, for this valley is one of the few regions where agriculture has been continuously prosperous in England.

Tewkesbury. Below Evesham the Avon is a solitary river again, for the rest of its course, another eighteen miles or so, flowing through a sparsely inhabited country. At its junction with the Severn some means of crossing the rivers was very necessary to provide a road northwards to the country of the Upper Severn from the Cotswold side of the vale. Here too a third river, a small stream from the east, flows in, so that Tewkesbury, the town that grew up at this spot, was a very important crossing-place with its three bridges over the three rivers. It naturally attracted a great deal of the business of the three valleys, and its military importance was of course considerable. It has experienced battle, capture, and recapture during the Wars of the Roses and the Great Rebellion.

Gloucester is the next crossing-place of the Severn and the last before the river becomes too wide for ordinary bridging. There is a quite modern bridge, three-quarters of a mile long, much farther down across the estuary near Berkeley. Such an important position on the Severn, the lowest easy crossing-place, guarding the great south road into Wales, was very early occupied as a place of settlement. A large Roman camp called Glevum was placed here, which after the Saxon conquest grew into a town. It not only commanded the east-to-west road into Wales but a north-to-south route as well along the Severn Valley, and it stands also in a fertile plain, so that as agriculture and the other arts of peace developed it grew from a place of defence into one of the foremost towns in the kingdom. By the sixteenth century it ranked among the first six towns of the

country. It was of course always the strategic as well as the economic centre of the western lowland, and hence important in all the political struggles of our history (see pp. 72 and 90). It was besieged during the Great Rebellion, and has often been the scene of important action and the head-quarters of an army. Since the cutting of the Berkeley and Gloucester Canal the town

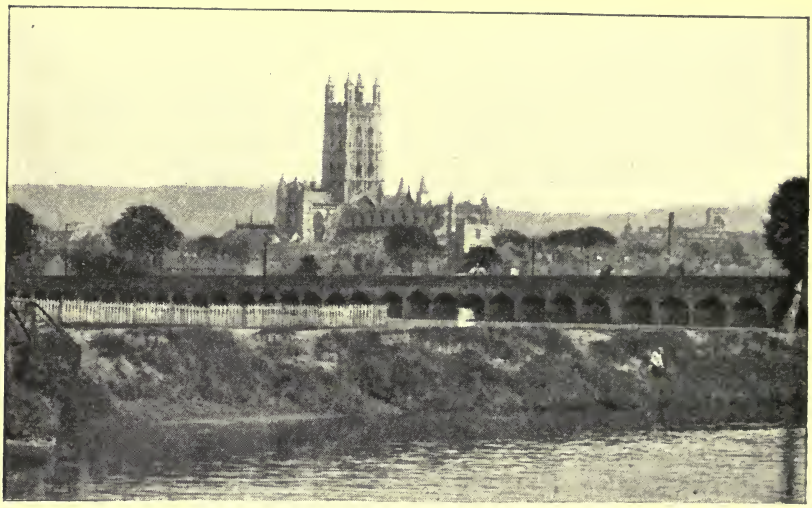


Fig. 25. View of Gloucester Cathedral.

has been able to take to shipbuilding, and it has also developed some other iron-working industries. It is within easy reach of both iron and coal. You will notice that Gloucester is not built on the main stream of the Severn, the ground is too damp along there, but on a gentle slope that rises above a small branch channel that has separated off from the river as it flows over this very flat part of the valley.

Bristol. There is no place along the estuary of the river suitable for a town—the banks are too low and

shelving; yet a port was needed here to provide an outlet for the Severn country. So Bristol grew up on the tidal and navigable River Avon, which enters the estuary in its lower, deeper part. The west-country export trade, however, was not very great in early days, and at first Bristol was chiefly famous for its salmon; but with the development of trade to the west, beginning with Ireland in the fifteenth century, and then spreading to Iceland and America in the seventeenth, it became the second port in the kingdom, coming next after London in size and wealth. For a long time it usurped all the trade going westward over the Atlantic, for our great north-western ports, Liverpool and Manchester, were of no importance before the industrial developments of the nineteenth century. The north-western country was an infertile and little-inhabited upland region of no economic value till the means of making use of its great mineral wealth were discovered at the end of the eighteenth century. After that Bristol was outdistanced by Liverpool and lost much of its importance, but its trade is now increasing. It has kept some of the trade of the southern United States, and does a good deal of the newer West Indian trade: tobacco, sugar, and bananas are the most important products in which it trades. But the largest modern steamships cannot come right up the river to Bristol, and for this reason Avonmouth has grown up, right on the Channel.

There are no other towns of any importance in the region. A clay country, as we saw before, is not a very good place for habitation, and the greater part of this clay plain is only thinly populated. As in the similar Oxford region, the villages are very small and scattered.

Communications. The roads, like the towns and villages, have been placed well away from the rivers

except where they have to cross them. There is one important highroad connecting Bristol with the Midlands, following the direction of the Severn-Avon, but running either midway between the river and the Cotswold escarpment, or else near the foot of the latter. From Bristol to Gloucester and Cheltenham it is out in the plain, and from Cheltenham north-eastward to Stratford is continued close to the escarpment, a branch going to Tewkesbury. There is no corresponding road on the other side of the Severn; the important traffic keeps to the east of the river. The Severn and the Avon have not been bridged at many points, so the cross-Cotswold routes that come down on to the plain at several different places have to draw together at these few points to get over the rivers. Those over the southern part of the uplands converge on two points, Gloucester and Tewkesbury, to cross the Severn, and the northerly routes on two more, Evesham and Stratford, to cross the Avon.

Railways. The railroads, of which there are not very many, follow the lines of these main roads almost exactly; but a great deal of the Vale of Gloucester, like the plain of the Upper Thames, is untouched by railways.

CHAPTER XVIII

GENERAL MAP STUDIES, AND COMMUNICATIONS

It was said in the beginning of this book that the region we are studying is part of a larger region of the same kind that occupies nearly all middle England. It is now time to consider this statement with some attention, and to see more about the relationship of our region to the rest of the country.

Limestone Uplands. Examine again a general physical map of South-east England, and see how the higher land that forms the Cotswolds is continued northwards towards the Humber estuary. As it nears this estuary it becomes so low that it does not show on the map giving heights, but it can be followed on the geological map. Some little way north of the Humber in Yorkshire, however, it is seen again as a large mass of high land called the North Yorkshire Moors. All this higher land is formed of the same kind of porous limestone rock which runs in a long belt across Mid-England (see map, p. 97), and everywhere forms the same kind of scarped ridge (see p. 12).

Chalk Uplands. In the same way the chalk uplands are continued northwards from the Chilterns on into Suffolk and Norfolk, where they are cut across by the opening of the Wash and beyond form the Lincoln and Yorkshire Wolds. You can follow this belt of chalk on the map on p. 97, as well.

Clay Vales. You will also see on this map that the belts of clay that form the Vales of the Upper Thames and the Severn-Avon, the Oxford clay and the Lias clay, are likewise continued northwards alongside the oolitic limestone and the chalk.

Economic Conditions. These four parallel belts that form our region being carried on, all the economic characteristics resulting from the nature of the rocks of which they are made are continued also, except where the presence of minerals such as coal and iron near at hand alters the condition of affairs. Notice that the same types of country run on southwards as well, though less clearly marked, to the coast in Dorset.

Industrial History. All this agricultural and pastoral country used to be the most important part of England in the early centuries, because it produced the food-supply of the country. Now food is easily obtained from other parts of the world, where there is more space for agriculture on a large scale and more dependable climates than in our islands, and so the minerals have become more important to us and the country has become industrial rather than agricultural. This means that other regions have grown in importance at the expense of those that used to be the most considered and the most thickly populated.

North-west Britain. Now one of the most important minerals is coal, on which all industries depend, and that is only found in rocks that are older than those which form the central and southern parts of England. These older rocks form the greater part of North-west England, of Scotland and of Wales, and the fact that they are old and hard makes them resist weathering, so here we find all the highest lands of Britain. They are the really mountainous regions,

FIG. 26. NATURAL REGIONS OF ENGLAND AND WALES.

quite different from the comparatively low uplands that we have been considering. In fact, all South-eastern England is often known as the Plain of England, in distinction to the north-west highland region. It is in the middle part between the Trent and the great central valley of Scotland that most of our coal is found, and here the chief manufactures have been developed.

It is true that there is older rock, some of which is carboniferous (or coal-bearing), buried deep underneath the younger rocks of South-east England, but until quite lately it was thought impossible to work this coal, so its existence has not made any difference to the economic conditions of the country.

Communications. Between these manufacturing centres of the north-west and the capital, London, there is much coming and going, and all middle England, including the Upper Thames basin, is from this point of view just a region that has to be got over by the roads and railways, and naturally the country round the main routes and the towns on them have become the most flourishing parts of these Midlands. The scarped ridges of the limestone and chalk belts form the chief obstacles in the way from London both north and west, and the highest parts of these are, as we saw, in the Upper Thames region.

Northern Routes. The main roads and railways to the north, however, need only be taken over the eastern end of our region, and indeed most of them cross the chalk belt just outside it and are able to avoid the high edge of the Cotswolds altogether, so the Upper Thames basin is not much affected by them. If you draw a straight line from London to Liverpool it cuts across the corner of the basin, passing almost through the Berkhampstead-Tring Gap, so that the railroad has only

had to take a slight divergence from the direct line in order to make use of this natural route across the

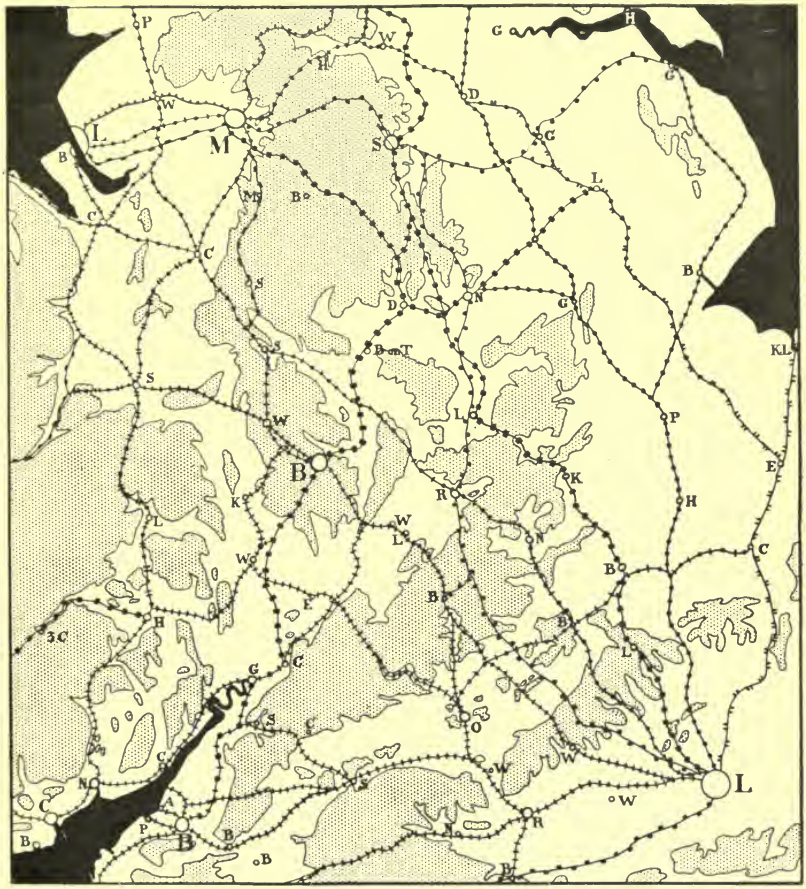


FIG. 27. ROUTES AND TOWNS OF CENTRAL ENGLAND.

Chiltern barrier. This, the North Western Railway, and the Great Central which uses the Wendover Gap, are

the only important through northerly routes within our region. The Midland Railway to Manchester and Scotland passes through the Luton Gap, the depression which we took as the limit of the Chilterns, and which is beyond our region.

Western Routes. Wales, though not of such great industrial importance as North Britain, yet contains in the south a large mining district where the best hard coal is found. In getting from London to South Wales both our scarped ridges must be crossed; there is no escaping the Cotswold barrier, as can easily be done in going northwards. The Great Western is the Railway Company that manages the communications between London and the West.

The most rapid glance at the map shows that the Thames Gap at Goring opens the obvious easy way through the chalk barrier, for it is almost in a straight line with London. The rail then follows the Vale of the White Horse, and branches into two at the western end of the lowland. One line takes advantage of the Stroudwater gap to reach the Severn lowland, and the other more important line continues south to the deeply cut Bath Gap and tunnels under the Severn estuary to shorten the distance to the Welsh coastal plain. The Great Western sends another of its main lines north after it has passed through the Goring Gap. This is the line that follows the Cherwell valley and goes on to the Cheshire plain. It is important, as passing through the Birmingham iron district, but this route is rather a long way round from London, so a more direct line has just been made, crossing the Chilterns by the Princes Risborough Gap, and continuing on through Bicester to Banbury and the north-west. The fast trains to Birmingham and beyond now run along this line, and

the central part of the Upper Thames region is even less used than formerly as a passage way from London to the busy manufacturing north-west.

Great Central Route. Quite recently, through railway communication has been established from north to south, from the Midlands to the south coast straight across the Upper Thames basin. A direct north to south route across both the uplands is provided by the Cherwell valley and the Goring Gap. The Great Central Company supplies the communications this way, running in part over older lines, for instance, the Great Western from Banbury to Reading, and in parts over new lines of their own, thus linking up a great north-to-south route.

Highroads. The main highroads follow on the whole the same lines as the railroads, as they have to consider the same general physical features. This is especially true of the modern roads, but sometimes these follow slightly different routes because they have to consider the possibilities of horse power, which is very different in degree from that of steam power. Also a road has to serve a rather different purpose from a railway, and at different periods of history the purposes of roads themselves have been different. For this reason the ancient and the modern roads have not always followed the same routes. The modern routes and the geographical conditions that have influenced their direction have already been considered, we will now look at the routes of earlier times.

CHAPTER XIX

ANCIENT ROADS

Roman Roads. The oldest roads that can be traced to any extent in Britain are the Roman roads. Let us look first at the routes followed by them, and then consider what is known about older routes still in the times before the Romans came to Britain and before any history was written.

The Romans had only two large settlements within our area, Corinium, the present Cirencester, and Glevum or Gloucester (see p. 91). The existence of Corinium in an important Cotswold valley (see p. 28) caused two great highroads to be brought across the western end of the Upper Thames valley, otherwise the main Roman roads, like those of modern days, skirted our district on their way northwards. The Romans were in a hurry to get across it for strategic reasons, just as we are for economic reasons.

Watling Street. The great road from London to the north-west known as Watling Street crossed the eastern end of the Chilterns by the high Dunstable Gap, the gap which has been passed over by the railway surveyor on account of its height. In Roman days the higher ground was considered safer, as you could see farther over the country, and also escaped the dangers that might be lurking in the woods of the valleys and the lower, damper ground.

Ermin Street. The road that leads from London to the west, Ermin Street[1], after avoiding the marshy land of the Lower Thames, entered the Kennet valley and cut across the White Horse Downs to Cirencester, and thence went on across the Cotswolds to Glevum (Gloucester), also avoiding the wooded valleys of the uplands.

The Fosse Way. Another great road running from the south-west to the north-east also came to Cirencester, keeping along the middle slopes of the Cotswolds. At Stow-on-the-Wold it descended into the Avon basin by the Stour depression, and continued along the higher ground that cuts off the Vale of the Red Horse from the Avon lowlands and so to Ratae (Leicester). This road is known as the Fosse Way.

These three roads were all main trunk lines of the Roman system of communication. A lesser road also crossed our region, connecting the larger ones. This Akeman Street started at Cirencester and ran to Watling and Ermin Streets, and therefore had to cross part of the clay lowland. It was careful to avoid the river Thames, but ran parallel to it about five miles away, skirting the lower slopes of the Cotswolds. It crossed the Cherwell near Kirtlington village, and near Bicester it branched into three. One road went north and joined Watling Street at Towcester, the crossing place of the river Tove. Another went straight on to the Chiltern escarpment, and the third turned south and passed through the Goring Gap to Ermin Street at Calleva Atrebatum (Silchester).

In most cases these Roman roads have been 'made over' into the modern roads, but sometimes the newer

[1] This must not be confused with the Ermine Street which runs north from London to the Scottish border.

route makes a détour, say to reach some villages or to go more directly to some town, or for other reasons that have become important since Roman days, and the old road can be seen now only a disused grass-grown lane. These can be easily recognized by their straightness, for whenever the Romans could they took their roads along an absolutely straight line. Those who live at Oxford can easily see a disused bit of the southern branch of Akeman Street on the right hand side of the Horspath road, about a mile before that village is reached. It runs quite straight between high hedges, and it is evident from the grass that covers the road that no one goes along it now.

Settlements. The Romans, of course, had military stations or camps at important points along these roads, and the remains of some are yet to be found, and also of Roman villas. There were, at any rate, two such military stations in the Upper Thames basin, one at Dorchester, close to the river and not far from the Goring Gap. Another was at Alchester near Bicester, the point where Akeman Street branches in three directions.

In the limestone area the Romans found it necessary to have their dwellings in the valleys for the water-supply, and just as you find the present villages near the streams, so the remains of Roman villas are discovered in the Cotswold valleys. One can be seen in the Evenlode valley where Akeman Street runs not far from Stonesfield, and another in the Churn valley at Chedworth close to the Fosse Way.

Prehistoric Roads. In earlier days the chalk hills of Southern England were the great route ways, for various reasons. Then, even more than in Roman times, the high ground was preferred. The clay vales of this part of the country were thickly wooded and

often marshy and generally unfit for habitation. Fever was the result of any attempt to live in them while undrained. The wild beasts, especially the wolf, the great terror of early British days, had their homes there, and the dampness of the ground and the thickness of the wood made movement difficult. This being the case, both villages and roads 'took' to the hill-tops, and only later descended to the lower land and valleys. The chalk and other limestone areas were dry and healthy, and provided good food for the flocks of sheep on which the early inhabitants of Britain depended.

Ridgeways. In the limestone regions the valleys, as has been seen, are steep-sided and difficult to cross, so the tracks used ran along the highest ground near the edges of the escarpments where there were no rivers or valleys to cross. These tracks are called ridgeways.

One follows the crest of the Chilterns and White Horse Downs. If you go to the top, say by the White Horse itself, you will see it now a broad grassy way that was first used perhaps 2,000 years before the Christian era. It was used for a long period in historic times as well as prehistoric for pedestrian and horse traffic, but not of course for wheeled vehicles.

Another of the old ridgeways ran along the Cotswold edge, probably near where the present road runs from Bath along the highest part of the upland by Stow-on-the-Wold to the northern end of the Edgehill.

Trade Routes. These ridgeway tracks were much used, because in early prehistoric days a great deal of trade was carried on across England, and they were important trade routes. It may be wondered what was the trade of the ancient Britons! It was largely in gold. Ireland was, in those days, a land of gold. It

had rich deposits of easily obtained alluvial gold—long since exhausted. It was to fetch this that traders followed these old routes, many coming from the continent for Irish gold. The way from the south coast to the mouth of the Dee, and so across to Ireland, was along the top of the chalk uplands, on along the Cotswolds, and thence north-westwards to the ports of the Dee and Mersey.

Later, when the art of bridging was understood, roads could be taken lower down the slopes of the uplands, though the marshes and forests still had to be avoided, while the introduction of wheeled traffic made the use of the high ridgeways inconvenient. Lower roads began to be used as well therefore before the Romans came, but their greater skill enabled them to take other and more direct routes, as they could overcome greater natural obstacles.

The British roads were not 'made' in any sense, they were merely worn by use, but the Roman roads were very carefully and strongly built of stone.

CHAPTER XX

POPULATION AND POLITICAL DIVISIONS

Population. The regions of Britain that are increasing in population to any extent at the present day are the regions whose geographical character allows manufacturing and other industries to be developed. Naturally then we do not expect the Upper Thames and the Severn regions to be growing much in population, nor when compared with the industrial areas do we expect them to be at all thickly inhabited. When we study a map showing how people are distributed over the country, we find that these regions are some of the quite thinly populated parts of the islands. Only the wild moorlands of North Britain, the Welsh Highlands, and the mountainous and boggy parts of Ireland, have fewer people to the square mile. It is a great contrast to the Lower Thames district in this respect. But the population, as we have seen, is not evenly spread over all of our five natural regions. Look at the map on page 109, showing the density of population for every square mile, and see how clearly each stands out on it. They can be seen almost as clearly as on the contoured map.

The dotted areas have the fewest people, and these correspond with, first the White Horse Downs, the region which, as we saw, was most outside modern developments and most untouched by the main routes from London. Secondly, there is a similar strip of land along the chief rivers of the Oxford plain and along the Severn. It will be recognized at once that this is on account of the floods near these rivers.

The third dotted area is the Cotswold uplands. Here, the comparative scarcity of water helps to limit the population, and there is not enough work to employ many people. Purely agricultural and pastoral regions such as these never provide employment for more than a small population. Notice the little tongues of more thickly inhabited land that run up into the uplands. These, of course, are the river valleys where the lines of villages are placed. The population varies in the Chilterns. Some of the higher parts of the upland have the same average as the Cotswolds, but the districts in and near the gaps are quite densely peopled. This section of the chalk uplands has more people than the White Horse Downs, mainly because of its greater nearness to London, and because the through routes to the north-west pass across it.

The two plains are, as a whole, more thickly peopled than the uplands, excepting those Chiltern valleys near London. Although on the clay areas that have no surface deposits on the top of the clay, the houses and villages are few, yet the lowlands have some larger centres in the better situations that have grown up as markets for the produce both of upland and lowland, and these raise the average for the whole plain. There are small industrial developments also in some of these towns of the plain that bring more people to them, and to the district round about. There is the blanket manufacture of Witney, for instance, and the cloth of Stroud. Again, there are educational centres, such as Oxford and Cheltenham, which attract many people, not only to the town itself, but to the country all round ; and lastly, the coal of the southern part of the Severn plain has run up the average very much in this region.

Political Divisions. For purposes of government

and administration our region of scarp lands and plains belongs to six different divisions ; that is, to the counties or shires of Gloucester, Oxford, Bucks, Berks, Wilts, and Warwick.

History of the Shires. The division of England into shires is a very old one, and, in most cases, the boundary

FIG. 28. *J. Bartholomew & Co.*

lines between them have been very little altered since the first. Nearly all the shires were formed before the Norman conquest, in the days when the country was first united into one kingdom after the Anglo-Saxon invasion and settlements. Some of them were the same as the smaller separate kingdoms of still earlier days, such as Sussex and Essex. Others were formed by the amalgamation of several smaller Anglo-Saxon divisions known as Hundreds. These Hundreds still exist as sub-

divisions in some counties. The counties of our region were formed this way and have no tribal or racial distinction. Now the extent and the actual boundary of these old kingdoms and shires always had some relation to the geography of the region. Let us look at the boundaries of our counties.

Boundary Lines. Two of the important geographical features that have been the cause of so much in the present economic condition of our region have also affected the matter of the position of the boundary lines. One of these is the marshy nature of the lowlying land along the river Thames. This was much worse in the old days than now, when some draining has been done and the course of the river is regulated to a certain extent. Before this there was a very broad belt of land that was always difficult to cross, and when the river rose was practically impassable. Hence this strip of land was left alone. It was approached from either side along the drier lands, and settlement came gradually nearer to the river, but an uninhabited belt was left on both sides always dividing the inhabitants. For this reason, the line of the river made a convenient boundary, and the Thames is, and always has been, a boundary all along its course. In our region it divides Oxfordshire from Berkshire all the way from Lechlade to Henley, fifty miles or so, and below Henley, Berkshire from Buckinghamshire. The lower part of the Bath Avon, which flows through another low damp area, divides the counties of Gloucester and Somerset.

The second geographical consideration that has influenced the drawing of our boundary lines, is that in the porous uplands the river valleys are the most habitable regions, and the bare dry ridges of Down between them are the uninhabited areas dividing the

inhabitants of each valley. Hence when a boundary is made in these regions it is naturally drawn along such an uninhabited ridge and not along the rivers. Follow the division between Berkshire and Wiltshire. As it crosses the White Horse Downs, it runs along the ridge that divides the Lambourn and Aldbourne valleys. The division between Oxfordshire and Buckinghamshire

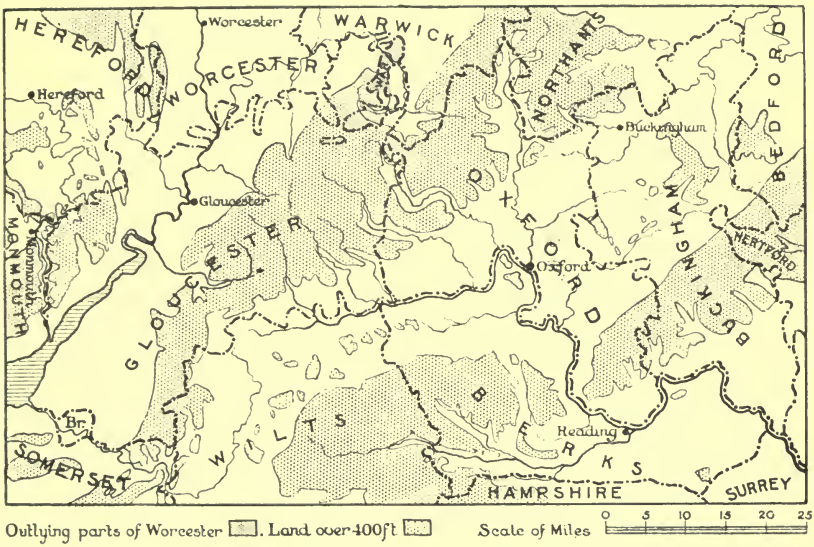


FIG. 29. COUNTY BOUNDARIES.

crosses the Chilterns along several ridges, while between Oxford and Warwick it follows the edge of the Cotswold escarpment.

The general principle that underlies these facts with regard to the boundaries of this region is this, that political boundaries are likely to run through uninhabited or little inhabited regions. This is a principle that you will find applies very often to boundaries in all parts of the world.

Summary. We have now completed the study of this region of Middle England. The whole of it, upland and lowland, lies rather apart from the important centres of modern economic life. It is a quiet and uneventful region, but in the past it has not been so. As we saw, the Severn valley has been important in our history as the convenient centre of political movements in opposition to the power at London, being a wide and fertile lowland with easy communications northwards and north-eastwards. Thus in times of disturbance the region between the Severn and the Lower Thames was a kind of border country, and for this reason, generally bore the bulk of the fighting. The great struggles, the battles and the sieges would always take place in the intermediate region between the two centres. The past historical importance of our region was much greater then than its present political and economic importance. Though the natural divisions, the limestone uplands and the clay lowlands, are very different in character, as our study of them has shown, yet they complete each other very well, and together produce the chief necessities of life. This was especially noticeable in the past, when it was more difficult to convey things from a distance. The pastoral hills supply the vales with wool and water, and the richer vales give to the hills corn and milk.

CHAPTER XXI

THE GEOGRAPHY OF OXFORDSHIRE

Divisions. The County of Oxfordshire is not a natural geographical region or division, but has within its boundaries several different kinds of country. It is made up of bits of all the natural regions of the Upper Thames basin, which have been separated off for purposes of local government. Some of Oxfordshire is lowland and some is upland. It comprises a large part of the Oxford clay plain, including most of the northern section of the Upper Thames vale and all the plain of the Ray and some of the eastern half of the Kimmeridge clay belt. It has the whole of the northern section of the Cotswolds, with a small slice of the central section, and on the other south-eastern side of the plain it has the southern end of the Chiltern upland. Oxfordshire, then, contains examples of all the belts of country in the Upper Thames region, with almost equal parts of Cotswold upland and clay plain, the chalk area of the county being much smaller.

Boundaries. Look now at the imaginary line which cuts off these parts of the different regions and binds them together into one unit of administration. In the Cotswold region in the north-west of the county the high edge of the escarpment divides it from Warwickshire, and the boundary line follows a well-marked geographical line. It runs from the head of the Cherwell valley near the crest of the Edgehill and on south-westwards along

the high edge of the northern section of the uplands. Then it follows the river Evenlode for about five miles, mounts the other side of its valley and goes almost due south across the slopes of the Central Cotswolds, making straight for the plain. It follows the Leach from the point where that stream emerges from the uplands, and so to the Thames, leaving the rest of the Cotswolds to Gloucestershire (see Fig. 29).

The river Thames, as we have seen, makes an excellent boundary because of the marshy character of its bed, and it formed the boundary between the Saxon kingdoms of Mercia and Wessex in the eighth century. It now forms, and has always formed, the southern boundary of Oxfordshire, once part of the Mercian kingdom, dividing it from Berkshire, originally part of Wessex. All the country bordering the north bank of the river from Lechlade down to Henley belongs to Oxfordshire, and this includes the western end of the Chilterns that lies within the great bend of the Thames between Goring and Henley. From here the boundary runs north along a ridge of chalk between the Stonor and Hambledon valleys, and reaches the escarpment, near which it runs north-eastwards to the Princes Risborough Gap where it descends to the plain of the Thame. It continues across the lowland in a general north-westerly direction, making several small digressions but keeping west of Brill hill. In many places the rivers are made use of, because, being like the Thames in character, though in a lesser degree, they are convenient for boundaries. The Thame, the Ouse, and the Cherwell all in parts form sections of the county boundary on this side.

Economic Geography. The county is used in almost equal parts as arable and grass land, and of the grass land an area roughly equal to one-quarter of the county

is kept for hay and the other quarter for permanent pasture. Wheat is the most important corn crop grown on the arable land, covering about one-twelfth of the total area of the county ; but barley and oats are grown nearly as extensively both on the lighter soils of the slopes of the upland and in rotation on the heavier wheat soils of the clay region. Altogether Oxfordshire is one of the more productive agricultural counties, coming next after those of the east in its proportion of cultivated land. The eastern counties grow the most corn, because they receive the greatest amount of sunshine of any part of the British Isles.

The sheep of Oxfordshire are very many, numbering 482 to every 1,000 acres, almost exactly the same proportion as that of the neighbouring county of Gloucestershire, which consists largely of Cotswold country with the Severn plain beyond, and so is not unlike Oxfordshire in general composition. The cattle are fewer in proportion to its size than in Buckinghamshire, its neighbour on the other side, with which it shares the eastern half of the clay plain, and where dairying, especially in the Vale of Aylesbury, is the chief occupation. Oxford has 148 cattle to the 1,000 acres and Bucks 172.

Towns. Our study of the map showing the distribution of population has already made clear in a general way how these districts are peopled. As Oxfordshire has practically no industrial development, the towns, excluding the special cases of Oxford and Henley, are merely agricultural and market centres, and all except one of these have fewer than 4,000 inhabitants.[1] That is to say, they are quite small towns. Banbury in the

[1] Caversham has over 6,000 inhabitants, but is really only a suburb of Reading, and should be considered with that town.

Cherwell valley is the one larger agricultural centre, and it is situated on a specially important north-to-south route-way along which there is both railway and canal communication. As a result small manufactures of articles needed for farming have grown up in this town. It is very much more important than the other centres,

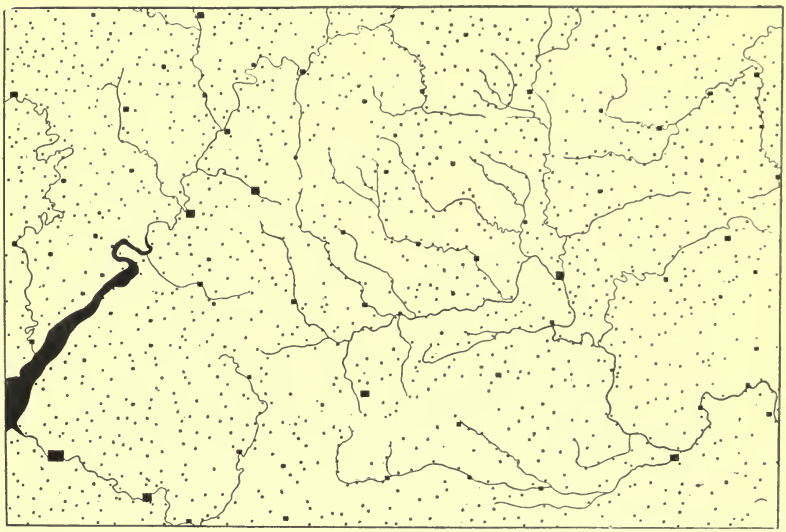


FIG. 30.

and has over 13,000 inhabitants. The rest of those forming the first rank of market towns number somewhere near 3,000 inhabitants each. They are Thame, Bicester, and Witney on the plain, and Chipping Norton on the Cotswold upland. The Chiltern area of Oxfordshire is the wildest least-inhabited part of that upland, and has no towns on it. The position of the towns just mentioned have been examined on pages 29, 32, 33, and 55.

The market centres of the second rank are much smaller, hardly more than big villages in size, with little over 1,000 inhabitants each. There are only thirteen of them in the county, and the rest of the population is to be found in small villages, one hundred of them with less than 200 inhabitants. The most important of the smaller towns are perhaps Watlington, Woodstock, and Charlbury. Watlington is on the spring line at the foot of the Chilterns (see p. 54). It has no gap in the escarpment behind it, but its importance has been slightly increased by the branch line of rail from Princes Risborough. Charlbury and Woodstock are both in Cotswold valleys, Woodstock placed where the Glyme emerges on to the plain to join the Evenlode, and Charlbury built on a terrace above the river a little higher up the Evenlode valley. In both these little market towns some glove-making is carried on.

Henley and Oxford are both rather special cases, though they are very different in size and importance, because some factors not directly geographical have contributed towards their development. Henley with its 6,000 inhabitants is larger than the other river towns of this part of the Thames course, and has become a specially favourite river resort, because it stands at one end of an unusually straight reach of the river, suitable not only for ordinary boating but for racing. Hence a famous regatta is held here every year, which has made the town well-known and brought more people to live there. Great Marlow, equally picturesque in situation, is less than one-fifth the size.

Oxford (see p. 51), with over 59,000 inhabitants, cannot be compared with the other towns of the county or of any part of the clay plain. As the seat of one of the two oldest Universities of England it is world-famous,

and never thought of now as a local market centre. However, standing in the middle of a wide agricultural plain it was important enough as such before the making of railways to have a great yearly fair, attended by all the countryside, and known as St. Giles's Fair. This is

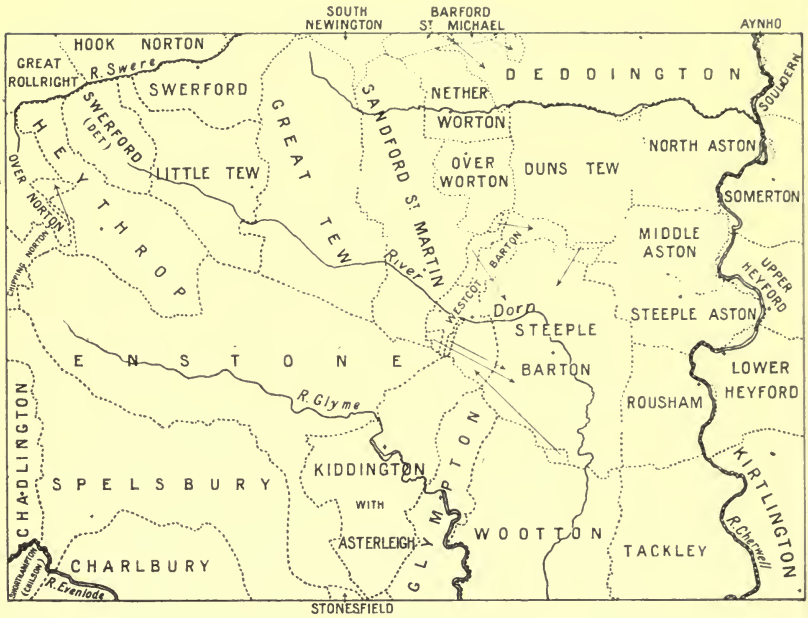


Fig 31. Parish Boundaries : Oxfordshire.

still kept up as a kind of fancy fair, though it is no longer needed to supply the neighbourhood.

Parishes. There is one more division of the area contained within the county to be considered. This is the division into parishes, the smallest units recognized for matters of local government. The limits of the various parishes have not been settled without regard to the nature of the country. In the towns there may

be more than one parish, but in the country the village is the centre of the parish, and the boundary runs across the country somewhere between that and the next village, the exact position being often decided by some physical feature.

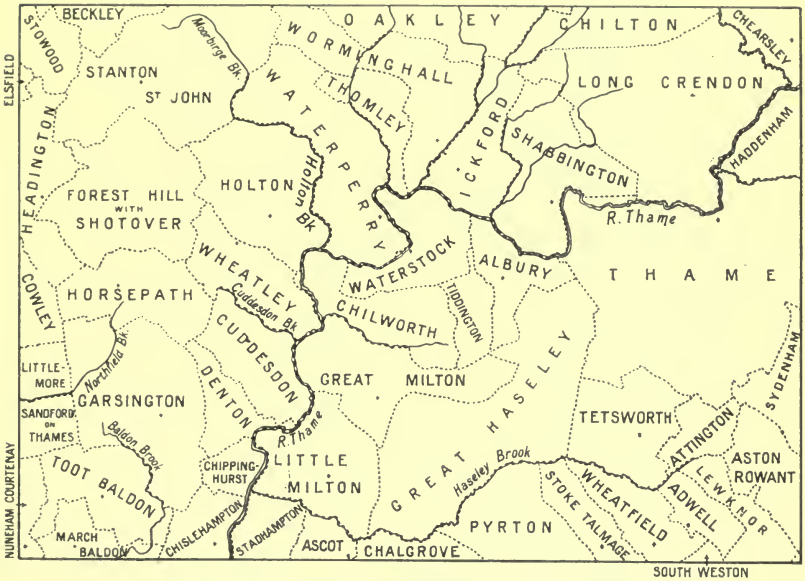


FIG. 32. PARISH BOUNDARIES: OXFORDSHIRE.

The size of the parish as well as its boundaries always depends a good deal on the nature of the country. For instance, when the country is rather poor and unproductive the parish is large, because the farms which compose it are large in order that the farmers may make enough profit. But in good fertile areas the farms and the parishes are smaller. Accordingly, the parishes in the Cotswold area of North Oxfordshire are larger than those of the more productive plain, and the same geographical features which influenced the placing

of the villages in these regions have effected the position of the boundary lines. Thus in the dry regions of the uplands, where the rivers are so important for water supply and the villages are often spread out on both sides of the stream, the parish boundaries usually run between the rivers and tend to follow the ridges which divide the valleys. This state of affairs is seen in the Cotswold and Chiltern areas of Oxfordshire. Look, for example, at the parishes whose village centres are in the valleys of the Glyme and Dorn. The division between Enstone, Kiddington, and Wootton on the Glyme, and Great Tew, Sandford, and Barton on the Dorn, runs along the crest of the ridge between the two valleys.

On the other hand, in regions where the rivers flow over a clay surface and are apt to flood, and are therefore avoided by villages, there they usually form the boundaries, and the parish consists of the block of land between two streams. This is the typical state of affairs on the Oxford and Kimmeridge clay plains. For instance, the Ray divides parishes nearly all along its course, and so does the Thame, and not only this but the east and west boundaries of these same parishes are formed by the little tributary streams. Nearly every little brook that runs into the Thame, from the Baldon Brook eastwards, makes a parish boundary.

The same principles are at work here guiding decisions as to boundaries, as in the case when the limits of larger units are settled, not only of counties but of countries, all over the world (see p. 111).

INDEX

Abingdon, 17, 51, 52, 61, 67.
Agriculture, 25, 26, 50, 78, 87, 90.
Aldbourne River, 70, 111; village, 70.
Alchester, 104.
Alderton Hill, 85.
Alluvium, 86.
Akeman Street, 28, 103, 104.
Amersham, 79, 80.
Andoversford, 36, 39.
Avon, Bristol, 9, 17, 22, 31, 61, 69, 74, 93, 110.
Avon, Stratford, river and valley, 81, 82, 83, 85, 87, 90, 91, 94, 103.
Avonmouth, 93.
Aylesbury, 43, 55, 58; Vale of, 87, 115.

Baldon Brook, 119.
Bampton, 55.
Banbury, 27, 39, 61, 100, 101, 115.
Barley, 26, 115.
Bath, 31, 32, 69, 100, 105.
Beaconsfield, 79.
Bedwyn Brook, 70.
Berkeley, 16, 82, 88, 91; Vale of, 82, 86, 88.
Berkhampstead, 75, 79, 80, 98.
Berkshire, 67, 110, 111.
Bicester, 58, 100, 103, 104, 116.
Birmingham, 61, 100.
Bishopstone, 64, 70.
Bredon Hill, 83.
Bricks, 35, 50, 56.
Brill, 43.
Bristol, 9, 29, 31, 57, 69, 83, 87, 88, 92, 93, 94.
Bristol Channel, 18, 81, 93.
Britain, North-west, 96, 98, 107; South-east, 98.
Broadway, 36, 89.
Burford, 25, 36, 58.

Canals, 60, 61.
Cattle, 26, 50, 67, 87, 88, 115.
Chalk, 12, 66, 68, 71, 75, 76, 78, 95, 105, 113.
Charlbury, 25, 116.
Chedworth, 104.
Chelt, 39.
Cheltenham, 16, 18, 22, 28, 36, 39, 89, 93, 108.
Cherwell, river and valley, 17, 23, 27, 39, 41, 42, 51, 57, 61 100, 101, 103, 113, 114, 116.
Chesham, 80.
Cheshire plain, 72, 100.
Chess, 78, 79.
Chepstow, 85.
Chiltern Uplands, 9, 10, 12, 15, 16, 17, 39, 56, 61, 62, 75–81, 95, 98, 99, 100, 102, 105, 111, 114.
Chipping Campden, 32, 33.
Chipping Norton, 18, 25, 33, 116.
Chipping Sodbury, 89.
Churn, 22, 27, 28, 104.
Cirencester, 15, 27–29, 31, 102, 103.
Civil Wars, 71, 72, 90, 91, 92, 112.
Clay plain, characteristics of, 11, 33, 35, 41, 43, 45, 47, 50, 52, 55, 56, 73, 93, 96, 104, 108, 112, 119.
Cleeve Hill, 22.
Climate, 14–17, 25.
Cloth-weaving, 24, 25, 28, 29, 32, 33, 52, 62, 67, 68, 71, 79, 88.
Coal, 25, 61, 82, 88, 96, 98, 100, 108.
Cole, 43.
Colne (Cotswold), 22, 27, 39; (Chiltern), 78, 79.
Cotswold Uplands, 10, 11, 12, 15, 16, 17–39, 41, 43, 44, 48, 50, 54, 57, 62, 67, 68, 71, 73, 74, 76, 78, 81, 95, 98, 100, 102, 103, 105, 106, 113, 114, 119.
Counties, history of, 109, 110; boundaries of, 110, 111, 113.
Cricklade, 42.

Cumnor Hill, 42.
Cyclones, 16.

Dairy-farming, 48, 50, 67, 87, 115.
Dean, Forest of, 82, 85, 88.
Didcot, 74.
Dip slope, 12, 18.
Dip streams, 23, 66, 78.
Dorn, 119.
Dorset, 96.
Dunstable, 75, 102.
Dursley, 22, 88, 89.

Edge Hill, 23, 83, 105, 113.
Ermin Street, 28, 103.
Ermine Street, 103.
Escarpment, 12, 45; Chiltern, 54, 75, 76, 79; Corallian, 43; Cotswold, 17, 18, 21–23, 39, 62, 64, 75, 83, 85, 89; White Horse Downs, 54, 57, 62, 66, 73, 75, 76.
Evenlode, 22, 23, 25, 31, 39, 104, 114, 116.
Evesham, 90, 91, 94; Vale of, 82, 83, 86, 87, 90.
Eynsham, 55.

Fairford, 25, 27, 58, 60, 79.
Faringdon, 44, 55, 58.
Flanders, 24.
Floods in Kennet valley, 66; in Severn plain, 82, 86, 107, 110; in Thames plain, 42, 44, 48, 51, 57, 60, 107, 110, 114, 119.
Ford towns, 51, 52, 90, 91.
Fosse Way, 28, 103, 104.

Gade, 78, 79.
Gap towns, 54, 55, 75, 89.
Gault clay, 11, 41.
Gloucester, 15, 28, 69, 72, 74, 82, 83, 87, 91, 92, 93, 102, 103; County, 85, 110, 114, 115; Vale of, 82, 83, 85, 87, 94.
Glove-making, 25, 116.
Gold, 105, 106.
Glyme, 116, 119.
Goring, 62, 100, 114.
Great Central Railway, 99, 101.
Great Western Railway, 54, 58, 70, 100, 101.

Hay and haymaking, 50.
Hackpen Hill, 64, 69.
Hambledon brook and valley, 76, 114.
Hampstead Norris, 64.
Hartley Hill, 22.
Hemel Hempstead, 79.
Henley, 76, 110, 114, 115, 116, 117.
High Wycombe, 79, 80.
Hops, 87.
Humber, 95.
Hungerford, 70, 73, 74.

Industries and Industrial History, 25, 93, 96, 98, 107, 108.
Ireland, 93, 105, 106, 107.
Iron and Iron Manufacture, 88, 89, 92, 96, 100.
Isis, 42.
Islip, 42, 58.

Kennet, river and valley, 62, 66, 67, 68, 69, 70, 71, 72, 73, 74, 103.
Kimmeridge clay, 11, 41, 42, 43, 44, 48, 55, 66, 113, 119.
Kineton, 83.
Kingham, 39.
Kirtlington, 103.

Lambourn, river and valley, 64, 68, 111; town, 70, 71.
Lansdown Hill, 21.
Lea, 78.
Leach, 114.
Lechlade, 60, 110, 114.
Leicester, 103.
Lias clay, 11, 81, 87, 96.
Limestone, 18, 20, 47, 60, 68, 81, 82, 95; corallian, 41, 43, 44, 57, 58; carboniferous, 82, 86, 88; oolitic, 12, 20, 33, 41, 64, 83, 96.
Lincoln, 95.
Liverpool, 93, 98.
Locks, 44.
London, 9, 28, 48, 50, 60, 61, 67, 68, 69, 70, 71, 72, 73, 74, 78, 79, 80, 81, 90, 93, 98, 100, 102, 103, 107, 112.
London clay, 66, 76.
Long Crendon, 43.
Luton, 75, 100.

Manchester, 93, 100.
Market towns, 32, 33, 55, 79, 88, 89, 108, 116, 117.
Marlborough, 15, 69, 70, 74.

Marlow, 80, 117.
Marshfield, 31.
Mercia, 114.
Midland Railway, 100.
Midlands, 9, 61, 71, 94, 98, 101.
Milton, Great, 43.
Misborne, 78, 79.
Missenden, 79.
Monmouth, 85.

Navigation on Severn, 83, 92; on Thames, 60, 61.
Newbury, 67, 68, 70, 71, 72, 74.
Normans, 88.
Norfolk, 75, 95.
Northampton heights, 17.
Northleach, 33, 36.
North-Western Railway, 99.

Oats, 26, 67, 115.
Occupation of Chilterns, 78; Cotswolds, 24-26; Oxford plain, 48, 50; Severn plain, 87, 88; White Horse Downs, 67.
Ock River, 42, 43, 44, 51, 52, 57, 58, 61, 66.
Og, 64.
Otmoor, 51.
Ouse, 75, 114.
Oxenton Hill, 85.
Oxford City, 14, 15, 16, 17, 23, 29, 41, 42, 51, 52, 57, 60, 61, 71, 74, 104, 108, 115, 116, 117; County, 110, 111, 113–20.
Oxford clay, 11, 41, 48, 50, 55, 66, 96.
Oxford plain, 10, 11, 15, 16, 17, 41–61, 72, 81, 82, 87, 89, 90, 93, 94, 96, 98, 107, 119.
Oxen, 25.

Pang, river and valley, 64, 66.
Parish boundaries, 117, 119; character of, 117, 119; size of, 118, 119.
Pasture, 24, 32, 33, 48, 50, 66, 67, 78, 86, 88, 114, 115.
Pewsey, Vale of, 70, 74.
Plateau, 18, 32, 38.
Political divisions, 108-11.
Population, distribution of, general, 107, 108, 115; Chilterns, 78, 108; Cotswolds, 27, 108; Oxfordshire, 115-17; Oxford plain, 51, 107; Severn plain, 89, 93, 108; White Horse Downs, 68, 107.
Princes Risborough, 54, 56, 75, 100, 114, 116.

Railways: Cotswold, 29, 39; Chiltern, 79; general, 98-101; Oxford plain, 58-60; Severn plain, 94; White Horse Downs, 74.
Rainfall, 16, 17, 24, 27.
Ray, river and valley, 42, 43, 57, 113, 119.
Reading, 60, 62, 68, 71, 72, 74, 101.
Red Horse, Vale of, 83, 87.
Rickmansworth, 79.
Ridgeways, 105, 106.
Rivers of plain and upland compared, 44, 45, 46, 47.
Roads, Chiltern, 79, 80; Cotswold, 34, 36-9; general, 101; Oxford plain, 51, 57, 58; Severn plain, 93, 94; prehistoric, 105; White Horse Downs, 73, 74.
Roman settlements, 28, 31, 91, 104; roads, 28, 75, 102-4, 106; villas, 28, 104.

Sandstone: greensand, 41, 43; new red, 81, 82; old red, 81, 82, 85.
Saperton, 60.
Scarped ridges, 12, 95, 98, 100.
Scarp slope, 12, 17.
Scarp streams, 20, 21.
Scotland, 96, 98, 100.
Severn-Avon Vale, 10, 11, 15, 17, 28, 31, 39, 57, 72, 81-94, 96, 100, 112.
Severn River, 9, 10, 28, 31, 60, 81, 83, 85, 86, 91, 92, 94.
Sheep, 24, 26, 32, 50, 52, 66, 67, 78, 104, 115.
Shipston-on-Stour, 31, 89.
Shrivenham, 55.
Silchester, 103.
Soil, of Chilterns, 78; Cotswolds, 24; Oxford plain, 48, 115; Severn plain, 87; White Horse Downs, 66, 67.

Southampton, 69, 74.
Spring-line villages and towns, 52, 54, 55, 89, 116.
Springs, 31, 32, 54, 55, 56.
St. Albans, 79.
Stonesfield, 104.
Stone, Cotswold, 33-5.
Stour, 21, 22, 23, 31, 39, 62, 83, 103.
Stow-on-the-Wold, 33, 36, 103, 105.
Stratford, 90, 93.
Stroud town, 29, 88, 89, 108.
Stroud Valley, 21, 28, 29, 31, 39, 60, 71, 74, 100.
Stroud Water, 21, 22, 39, 62.
Suffolk, 95.
Swindon, 54, 70, 74.

Temperature, 14, 15.
Tewkesbury, 91, 94.
Thame, river and plain, 42, 43, 48, 51, 55, 57, 58, 75, 114, 115, 119; town, 51, 55, 56, 116.
Thames River, 9, 10, 11, 17, 18, 23, 25, 28, 41, 42, 43, 44, 51, 52, 57, 58, 60, 61, 66, 68, 71, 76, 78, 80, 103, 110, 114.
Thames Gap, 11, 62, 66, 71, 72, 73, 74, 75, 81, 100, 101, 103, 104.
Tobacco, 87, 88, 93.
Tog Hill, 21.
Towns: Chilterns, 79; Cotswold, 27-35; Oxford plain, 51-6; Oxfordshire, 115, 116, 117; Severn plain, 89-93; White Horse Downs, 68-72.
Tove, 103.
Towcester, 103.
Trade routes, 105.
Tring, 54, 56, 61, 75, 98.

Usk, 85.

Valleys: dry, 62, 64, 73, 75, 76; plain and upland compared, 45, 46, 47, 78.
Villages: Chilterns, 78, 79; Cotswold, 27-35; Oxford plain, 51-6; Severn plain, 89, 93; White Horse Downs, 68, 70.
Vineyards, 88.

Waddesdon, 55.
Wales, 28, 90, 91, 96, 100, 107.
Wallingford, 51, 52, 61.
Wantage, 54, 58, 73.
Warwick, 111; County, 113.
Wash, 75, 95.
Water-power, 25, 29, 33, 68.
Water-supply in Chilterns, 78, 119; in Cotswolds, 27, 34, 104, 108, 119; of Oxford plain, 52, 54, 55, 56; of Severn plain, 89; of White Horse Downs, 68.
Watford, 79.
Watling Street, 102, 103.
Watlington, 54, 116.
Weirs, 44.
Wendover, 54, 56, 75, 99.
Wessex, 114.
Wheat, 26, 48, 67, 87, 115.
Wheatley, 55, 58.
White Horse Downs, 9, 10, 12, 39, 52, 62-74, 76, 78, 81, 103, 105, 107, 111; Vale, 31, 43, 44, 48, 52, 87, 100.
Winchcomb, 22, 89.
Windrush, 22, 27, 38.
Witney, 27, 36, 58, 79, 108, 116.
Woods, distribution of, 18, 20; on uplands, 43, 44, 67, 76, 82, 85; in lowlands, 102, 104, 105.
Woodstock, 116.
Wool, 24, 32, 33, 36, 68.
Woollen Industry (see Cloth-weaving).
Worcester, 90.
Wye, Buckinghamshire, 78, 79; Gloucestershire, 85.
Wytham Hill, 42, 44.

Yorkshire Moors, 95; Wolds, 95.

Oxford: Horace Hart M.A. Printer to the University